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CONTENTS

	PAGE
NAYER, K. KARUNAKARAN, M.A., Ph.D. New Indian gall midges (Diptera, CECIDOMYIIDAE)	79–89, 17 figs
KEVAN, D. KEITH MCE., B.Sc., A.I.C.T.A., F.R.E.S. A revision of the East African genus *Acrostegastes* Karsch 1896 (ORTHOPTERA, ACRIDIDAE, CATANTOPINAE) .	90–96, 1 fig.
GILLETT, J. D. Further notes on the Ethiopian species of *Taeniorhynchus* Arribalzaga (Diptera, CULICIDAE). . . .	97–102.
JAMES, MAURICE T. A review of the Ethiopian species of *Chelonomima* (Diptera —STRATIOMYIIDAE), with notes and descriptions of other African PACHYGASTRINAE	103–108.
MACFIE, J. W. S., M.A., D.Sc., M.B., Ch.B. Notes on CERATOPOGONIDAE . . .	109–115. 3 figs.
GIMINGHAM, C. T., and HILLE RIS LAMBERS, D. A new British species of *Aphis* L., from *Rhamnus catharticus* (Homoptera, APHIDIDAE)	116–118. 1 fig. 1 plate.
BOOK NOTICE	102

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NEW INDIAN GALL MIDGES (DIPTERA, CECIDOMYIIDAE).*

By K. Karunakaran Nayar, M.A., Ph.D.

(Zoology Dept., University College, Trivandrum, S. India.)

While collections of gall midges (Diptera: Cecidomyiidae) made from Travancore in South India and from Calcutta in Bengal were being studied the following new forms were discovered. The collections from Travancore were made by me, the midges being either reared from galls or dead vegetable material or collected at light. The midges from Bengal were collected and placed at my disposal by Prof. M. S. Mani, Agra, and the collection comprised specimens caught at light in Calcutta by him in 1937.

The type specimens of all these species, with the exception of *Rubsaamenia artocarpi*, have been deposited in the Zoological Survey of India, Benares Cantt. The provisional numbers assigned to them are given in the text.

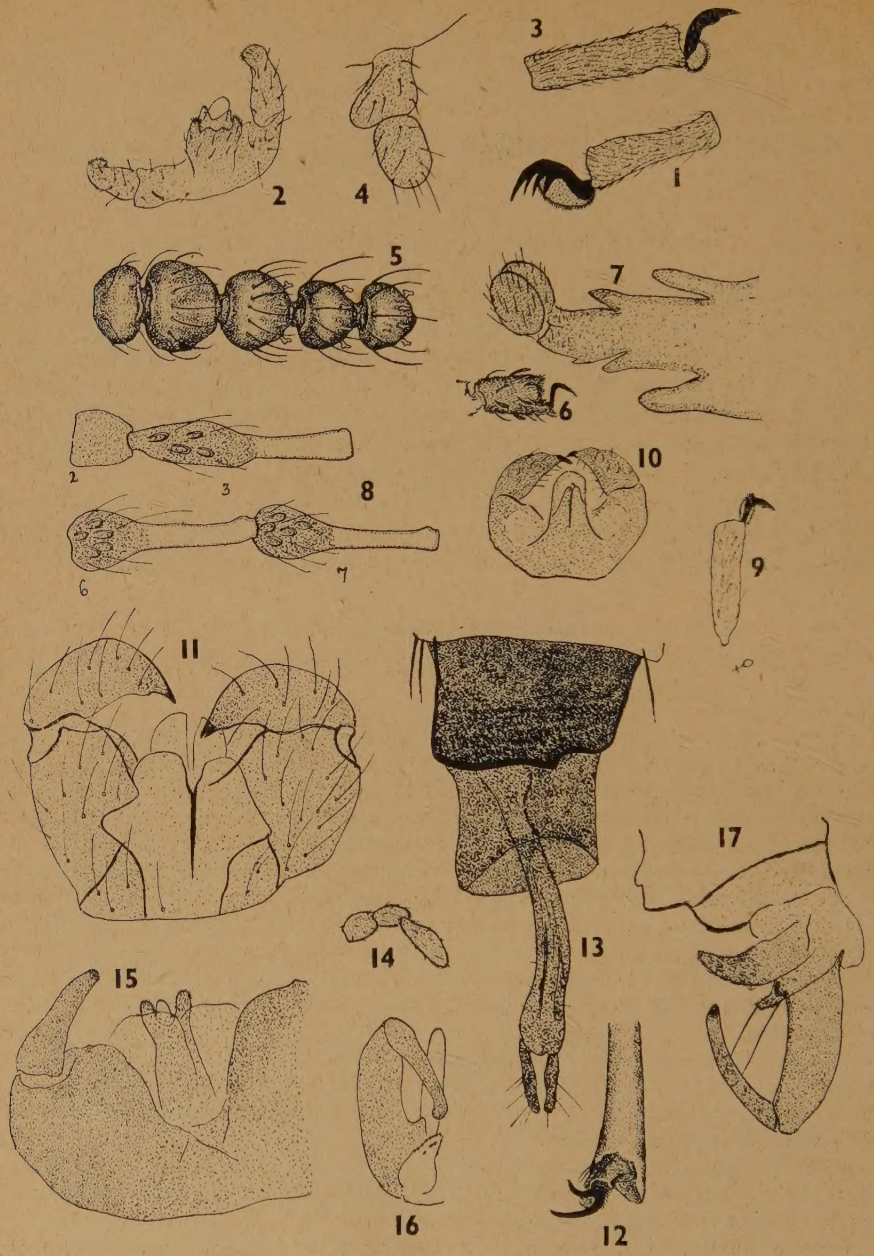
Anarete calcuttaense sp. n.

This species comprises male and female midges collected at light by Prof. M. S. Mani, from Calcutta in 1937.

Male.—2 mm. long, yellow in preserved condition. Palpi quadriarticulate, sparsely setose; first segment narrowed basally, longer than broad; fourth segment longest and thinnest, its thickness nearly half that of the first. Antennae with eleven segments, second segment conspicuously globose, the antennal segments decreasing in size towards the distal end, the necks increasing in size distally, the terminal segment smallest, roundish and devoid of a neck, the segments adorned with long setae, the setae of the terminal segment shorter and hair-like. First segment obconical, slightly thicker than long; second segment with its diameter little less than twice the thickness of the basal segment. Third segment pyriform with the thickness equal to the length of the first segment, neck very short; fourth segment similar in shape to the third, but slightly longer and thinner; tenth and eleventh segments without necks, rounded. Wings as in the genus *Anarete* Hal. Mesonotum brown. Scutellum and post-scutellum yellowish brown. Claws (fig. 1) quadridentate, as long as empodium. Genitalia moderately hairy; basal clasp segment roughly cylindrical; terminal clasp segment cylindrical, broadly rounded at tip, bearing fine hairs, its breadth equal to half its own length; dorsal plate deeply and broadly truncate with two broadly triangular, dentate lobes in the middle apically, the lobes nearly equal in length to the basal clasp segment and slightly emarginate; ventral plate longer than the dorsal plate, deeply bilobed and emarginate; style broad and as long as the ventral plate. The dorsal plate bears spinous setae as in the figure (fig. 2).

Female.—2 mm. long, yellow. Palpi quadriarticulate, short, moderately setose. Antennae with eleven segments, setose, second segment largest but not so pronounced as in the male. Flagellate antennal segments with very short stems, nearly globose, but gradually becoming pyriform distally, the terminal segment elongated. Third segment globose with a diameter equal to the length of the first segment; fourth segment slightly longer than broad; the stems well marked from the fifth segment onwards; eleventh segment longest, one and a half times as long as the tenth, with a stem as long as the thickness of the segment which is twice its own diameter. Wings as in male. Legs

* Part of thesis submitted for the Ph.D. degree of Travancore University.



Figs. 1–4.—*Anarete calcuttaense* sp. n. (1) Distal tarsal segment of the male; (2) genitalia of the male; (3) distal tarsal segment of the female; (4) terminal segment of ovipositor.

Figs. 5–7.—*Mycophila indica* sp. n. (5) First five antennal segments; (6) distal tarsal segment; (7) genitalia of the female.

Figs. 8–10.—*Clinophaena longiptera* sp. n. (8) Antennal segments 2, 3, 6, 7 of male; (9) distal tarsal segment of the female; (10) genitalia of the male.

Fig. 11.—*Camptomyia artocarpi* sp. n. Genitalia of the male.

Figs. 12–13.—*Hallomyia cardamomi* sp. n. (12) Distal tarsal segment showing the claw; (13) ovipositor.

Figs. 14–15.—*Bungomyia brachyrhyncha* sp. n. (14) Palp; (15) genitalia of the male.

Fig. 16.—*Odontodiplosis jonesi* sp. n. Genitalia of the male.

Fig. 17.—*Moreschiella erecta* sp. n. Genitalia of the male.

moderately hairy ; claws (fig. 3) simple, dilated subapically ; empodium less than half the length of the claws. Terminal lobes of the ovipositor (fig. 4) small, setose, circular ; basal lobes slightly produced ventrally.

Locality : CALCUTTA. *Male.*—No. $\frac{1107}{H\,8}$. *Female.*—No. $\frac{1108}{H\,8}$.

This species differs from the only other known Indian species, *Anarete indica* (Mani) in having eleven antennal segments in both sexes. Felt (1913) described *Anarete texana* (Felt) from Texas, with eleven antennal segments ; the present species differs from it in the larger size of the body, the tenth and eleventh antennal segments not fused, basal clasp segment devoid of a basal lobe, dorsal plate lobed and dentate and broad style.

Mycophila indica sp. n.

Female specimens of this species were collected by me from Trivandrum, at light.

Female.—0·9 mm. long, dark brown. Eyes confluent above. Palpi triarticulate, setose ; first segment subclavate, with the enlargement distal ; second segment cylindrical, equal in length to the first, with the inner margin at the distal end truncate ; third segment hatchet-shaped, rounded at tip, shorter than the second. Antennae less than half the length of the body, ten-segmented, first two segments globose, the second more so ; flagellate antennal segments without stems, third and fourth segments not fused, segments adorned with whorls of setae and stemmed discs subapically (fig. 5). Third segment roundish, its length slightly greater than its own thickness ; fourth segment pyriform, broader basally ; antennal segments decreasing in size distally ; tenth segment triangular, pointed towards the tip, slightly constricted in the middle. Wings about twice as long as broad, hairy, as in the genus *Mycophila* Felt. Mesonotum brown ; scutellum and postscutellum darker. Halteres dark brown. Legs brown, hairy ; claws (fig. 6) simple, bent at right angles, as long as the empodium. Abdomen blackish brown and moderately hairy. Ovipositor bilobed at apex (fig. 7).

Locality : TRIVANDRUM. No. $\frac{1112}{H\,8}$.

The following key is given for the separation of the four known species.

I. Antennal segments nine . . . . . *M. fungicola* Felt
II. Antennal segments ten
  A. Palpi biarticulate . . . . . *M. speyeri* Barnes
  B. Palpi triarticulate . . . . . *M. indica* sp. n.
III. Antennal segments eleven . . . . . *M. barnesi* Edwards

Vanchidiplosis gen. n.

This new genus is erected to receive a species taken at light in Trivandrum by the author. The following are the diagnostic characters of the genus :

Head prominent, with well defined neck. Trophus bluntly and conically produced. Eyes confluent above. Palpi quadriarticulate. Antennae with fifteen segments in both sexes, with tubercle-like spines, third and fourth segments fused together, terminal segment with an apical prolongation about one-third as long as the segment. Wings long and hairy, more than twice as long as broad, cross vein nearly at right angles to the costa, with four long veins, third vein reaching the wing margin slightly beyond the apex, fourth vein

faint but complete, fifth vein forked, sixth vein absent. Legs hairy and scaly, with the coxae carrying long hairs. Claws unidentate in female and denticulate in male ; empodium as long as claws. Genitalia hairy. Ovipositor with oval terminal lobes, small.

Genotype : *Vanchidiplosis vanchii* gen. et. sp. n.

The genus is named after Travancore (Vanchi : Travancore).

To show the relationships of this genus to other known genera, I modify Mani's Keys to the Genera from the Oriental Region (1946 : 196) as follows :

6. Palpi quadriarticulate, claws dentate or denticulate . . . . . 6a.
6a. Trophus prominent produced bluntly and conically forwards ; antennae with 15 segments in both sexes ; claws denticulate in male ; sixth vein absent . . . . . *Vanchidiplosis* gen. n.
Trophus normal ; antennae in female with 14 segments ; claws unidentate ; sixth vein present . . . . . *Bainidiplosis* Mani

Vanchidiplosis vanchii sp. n.

One male and several females were collected, but the male was accidentally lost. I have added the notes that I made about it, but no complete description of this sex is given.

Female.—1·3 mm. long, brown. Neck prominent, Palpi quadriarticulate and setose ; first segment cylindrical, basally narrowed ; second segment longer than the first, pointed distally ; third segment cylindrical, tapering slightly towards both ends ; fourth segment spatulate, longest. Antennae with fifteen segments, sparsely setose, flagellate antennal segments all dark brown with two whorls of setae on each. First segment obconic ; second segment pyriform-cylindrical, slightly darker, as long and as thick as the first ; third segment cylindrical, narrowed basally ; third and fourth segments fused together, fourth to fifteenth segments all cylindrical, segments decreasing in length distally ; fifteenth segment with a basal cylindrical enlargement and the neck forming a teat-like structure, the neck about one-third the length of the segment. Wings long and hairy, as in the genus. Legs, scaly, hairy ; claws unidentate ; empodium about as long as claws. Abdomen brown and smoky, hairy, more than half the length of the body, tapering posteriorly. Ovipositor small, with the terminal lobes oval, setose, four-fifths as broad as long.

Male.—1·2 mm. long ; yellowish brown. Trophus produced. Antennae comparatively small, with fifteen segments. Claws denticulate. Genitalia moderately hairy ; basal clasp segment with short but numerous spines ; terminal clasp segment slender, well chitinised at tip ; dorsal and ventral plates bifid.

Locality : Trivandrum. No. $\frac{1113}{H\,8}$.

Clinophaena longiptera sp. n.

I refer to this species male and female midges collected at light at Calcutta by Prof. M. S. Mani.

Male.—1·1 mm. long, yellowish brown. Palpi quadriarticulate, moderately setose ; first three segments cylindrical, subequal ; fourth segment oblong-ovoid, shortest. Trophus normal. Antennae incomplete, shrunk, with the flagellate antennal segments with basal enlargements and long stems (fig. 8), short circumfila ; antennal segments decreasing in length distally as also the basal enlargements ; flagellate segments with long setae ; third and fourth segments not fused together. First segment obconic, longer than broad ; second segment pyriform ; third segment with a length four times that of the second, the stem half the length of the segment ; fifth segment with a stem twice the length of the

basal enlargement; ninth segment three-fourths as long as the third; other antennal segments distorted. Wings as in the genus, but long and narrow, hyaline, about three and a half times as long as broad. Mesonotum blackish-brown; scutellum and post scutellum paler. Legs hairy, pale; claws simple, bent at right angles, faintly dilated subapically; empodium as long as claws. Abdomen more than half the length of the body, moderately hairy. Genitalia small (fig. 10); basal clasp segment broad, quadrate; terminal clasp segment short, pyriform, with a row of moderately long, stiff setae on the inner side and sparsely and irregularly scattered setae elsewhere, apically with a short, claw-like, inconspicuous tooth, three-fourths as long as the basal clasp segment; dorsal plate, short, bilobed, lobes moderately broad, emarginate and apically truncate; ventral plate nearly twice as long as the dorsal plate, truncate apically and emarginate; style longer than the dorsal plate, but shorter than the ventral.

Female.—1·2 mm. long, yellowish brown. Head concealed beneath the greatly arched mesonotum. Palpi quadriarticulate, as in male. Antennae incomplete; first and second segments globose, both nearly equal in diameter; flagellate antennal segments long; third segment with a length nearly eight times its own thickness, with a stem equal in length to its own thickness. Wings long and narrow, as in male. Claws simple (fig. 9). Abdomen nearly twice the length of the thorax. Terminal lobes of the ovipositor short, ovoid, nearly twice as long as broad, scarcely hairy.

Locality: CALCUTTA. *Male*—No. $\frac{1116}{H8}$. *Female*—No. $\frac{1116}{H8}$.

One species (*Clinophaena indica* Mani) is already known from India (Mani, 1934). The present species differs from it by the comparatively shorter length of the body, the normal trophus, the relatively narrower wings, the more or less equal sized palpal segments and the presence of a stem equal in length to that of the basal enlargement in the third antennal segment.

Rubsaamenia artocarpi sp. n.

I refer to this species female midges bred from decaying fruits of *Artocarpus integrifolia*.

Female.—1·7 mm. long, yellowish brown. Palpi quadriarticulate; long, sparsely setose; basal segment smallest, more or less cylindrical; third and fourth segments approximately equal sized. Antennae with twenty-one segments, moderately setose; first segment pyriform; second to twentieth segments with slight constriction in the middle of each and with very small necks; second segment cylindrical; third and fourth segments not fused together; the segments decreasing in size distally; penultimate segment cylindrical, its length a little less than the thickness of the second; terminal segment conical with a small, cylindrical protuberance, this process about three-eighths the length of the segment. Wings with a bluish tinge in the living midge, hairy, as in the genus. Mesonotum blackish brown. Legs pale brown, long; claws unidentate; empodium as long as claws. Abdomen yellowish, more than half the length of the body, with the distal portion recurved dorsally. Ovipositor with the terminal segment oblong-ovoid, its length a little less than double its own breadth.

Locality: TRIVANDRUM.

Camptomyia artocarpi sp. n.

This species is erected to receive midges bred together with *Rubsaamenia artocarpi*, from decaying fruits of *Artocarpus integrifolia* by the author.

Male.—2·7 mm. long, reddish brown. Eyes confluent above. Palpi quadriarticulate, borne on a conspicuous palpiger resembling a fifth segment, moderately setose. First

segment shortest; third segment longest. Antennae with twenty-two segments, the stems of segments increasing in length distally, antennae appearing moniliform. First segment pyriform; second segment small; third and fourth segments not fused together; third segment with a stem about half the length of the enlargement; fourth segment slightly broader than the third with the stem one and one-fourth as long as that of the third; twentieth segment with a stem nearly as long as the enlargement; penultimate segment with the shortest stem; terminal segment devoid of a stem, conical, with a blunt point. Wings about two and a half times as long as broad, sparsely hairy, as in the genus. Mesonotum dark brown. Scutellum and post-scutellum yellowish brown. Halteres pinkish brown. Legs long and hairy; claws unidentate; empodium as long as the claws. Abdomen more than half the length of the body, reddish brown, tapering towards the tip, hairy; dorsal and ventral ridges bearing comparatively long hairs, the tip recurved dorsally. Genitalia (fig. 11) small, hairy; basal clasp segment less than twice as long as broad, hairy; terminal clasp segment beak-like, heavily chitinised at tip, its breadth about two-thirds that of the basal; dorsal plate deeply bilobed, the lobes broadly rounded apically; ventral plate bilobed.

Female.—2·5 mm. long, reddish brown. Palpi quadriarticulate, fourth segment longest, moderately setose. Antennae with twenty-three segments; first segment pyriform; second segment roughly globose; third segment longest, stem with a length equal to half the thickness of the segment; fifth segment twice as long as broad; penultimate segment oblong-ovoid with the shortest of stems; terminal segment conical, bluntly pointed, twice as long as its greatest thickness. Mesonotum yellowish brown. Abdomen reddish, hairy, tapering, recurved dorsally. Ovipositor long, terminal segment bilobed.

Locality: TRIVANDRUM. *Male*—Nos. $\frac{1114}{H8}$ and $\frac{1115}{H8}$. *Female*—No. $\frac{1114}{H8}$.

This species differs from the other known Indian species in its comparatively large size, in the number of antennal segments, and the proportions of the male genitalia. It resembles *Camptomyia hibisci* Felt in the terminal clasp segment, but differs in the stemmed antennal segments of the female.

Modifying Mani's key (1934) the present species fits in as follows:

I. Antennal segments of female 24:

A. Fifth antennal segment with a length two and a half times its own diameter . . . . . *C. morindae* Felt

B. Fifth antennal segment with a length one-fourth its diameter *C. hibisci* Felt

II. Antennal segments of female 23 . . . . . *C. artocarpi* sp. n.

III. Antennal segments of female 21 . . . . . *C. ricini* Felt

Hallomyia cardamomi sp. n.

I refer to this species female midges bred from root galls on *Eletteria cardamomi* Maton.

Female.—4 mm. long, reddish; thorax somewhat hooded over head. Eyes confluent above. Palpi long, quadriarticulate, sparsely setose. First segment stoutest and shortest, with a length nearly double its own thickness; terminal segment longest, bluntly pointed, more or less truncate, curved, slightly longer than the third. Antennae with fourteen segments, third and fourth segments fused together, flagellate antennal segments with two rows of long, bristle-like setae. First segment pyriform; second segment conical, about half as long as the first; third segment cylindrical with two circular rows of conical, blunt

spines, with a small stem which is slightly smaller than the thickness of the segment; fourth segment as long as the third; fifth similar to fourth; terminal segment cylindrical bearing a conical structure at the tip, which is slightly longer than half the length of the basal cylindrical part. Mesonotum brown. Scutellum brown. Wings smoky, moderately hairy; the third vein meeting the wing margin beyond the apex. Halteres pale brown. Legs brownish yellow, long, hairy; claws highly chitinised, stout, unidentate; empodium shorter than claws (fig. 12). Abdomen cylindrical, more than half the length of the body, ventrally darker, tapering posteriorly, hairy and scaly. Ovipositor (fig. 13) slightly exserted, short and sparsely setose.

Locality: Pampadamparai Hills in the High Ranges of Travancore. No. 1120 H 8.

This species differs from the other known Indian species, *Hallomyia iris* Kieffer, in the relative length of its body, the brown mesonotum, fourteen antennal segments and the length of the flagellate antennal segments.

Jones (1944) mentions this species as one of the pests of cardamom in Travancore.

Bungomyia gen. n.

This new genus is erected for a male specimen in the collection of midges made by Prof. M. S. Mani. This genus differs from all the known bifilate genera with the flagellate antennal segments all binodose in that the males have the palpi triarticulate. The genus is characterised as follows:

Eyes confluent above. Trophus hairy, very reduced. Palpi triarticulate. Antennal segments binodose; segments three and four each with two whorls of circumfila, one on the basal and the other on the apical enlargements. Wings short, rounded, with four long veins, fifth vein forked. Legs hairy. Genitalia small; basal clasp segment large and quadrate, longer than broad; terminal clasp segment with the tip typically bidentate with a brush of stiff and short hairs; style long; dorsal plate broadly bifid; ventral plate deeply bifid with the lobes hairy.

Genotype: *Bungomyia brachyrhyncha* gen. et sp. n.

The genus is named after Bengal (Bunga: Bengal).

This genus runs near *Sissudiplosis* Mani, but is readily distinguished from it by the triarticulate palpi.

Modifying Felt's key to the world genera (1925) the genus fits in as follows:

aa.	Palpi triarticulate	
b.	Flagellate segments all binodose	*Bungomyia* gen. n.
bb.	All flagellate segments not binodose	*Dentifibula* group

The position of the genus *Bungomyia* in Mani's Keys to the Genera from the Oriental Region (1946 : 210) is as follows:

1.	Flagellate segments cylindrical or subcylindrical	2.
	Flagellate segments binodose	24.
24.	Palpi with four segments	25.
	Palpi with less than four segments	52.
52.	Palpi triarticulate	*Bungomyia* gen. n.
	Palpi uniarticulate	*Sissudiplosis* Mani

Bungomyia brachyrhyncha sp. n.

Male.—1·5 mm. long, brown. Eyes large. Trophus very small, hairy. Palpi small, triarticulate (fig. 14), sparsely hairy; first segment roundish; second segment ovoid; third segment longest, rounded at tip, cylindrical, about twice as long as thick. Antennae incomplete, third and fourth segments fused together; flagellate antennal segments all plainly binodose basally, so probably all segments binodose; circumfila in two distinct rows on the flagellate antennal segments; setae long. First segment broad distally, slightly longer than thick, with short setae; second segment globose, shorter than first; third segment with the apical and basal enlargements equal in diameter, the circumfila equal in length in both; fourth segment shorter than the third, the two enlargements equal in diameter, the length of the segment equal to twice the thickness of the first. Wings short and rounded, incomplete, fifth vein showing the beginnings of a fork. Halteres brown, hairy. Legs pale brown. Abdomen sparsely hairy, pale brown. Genitalia well chitinised, small (fig. 15), characteristic of the genus; terminal clasp segment slightly longer than the breadth of the basal clasp segment; style as long as the ventral plate.

Locality: Calcutta. Nos. $\frac{1121}{H\,8}$ and $\frac{1122}{H\,8}$.

Odontodiplosis jonesi sp. n.

I refer to this species a single male specimen collected from Trivandrum, by my colleague Mr. S. Jones, University of Travancore.

Male.—0·8 mm. long, brown. Eyes with a reddish tinge when freshly examined. Trophus small. Palpi triarticulate, small, sparsely setose; first segment cylindrical, nearly twice as long as thick; second segment ovoid; third spatulate with distal broad end, longest. Antennae with fourteen segments, slightly longer than the body; third and fourth segments fused together; basal enlargements of the flagellate antennal segments smaller than the apical; middle row of circumfila shorter; basal row equal to the diameter of the basal enlargement, apical row slightly longer than the basal row. First segment broadly conical; second segment rounded, with the apical end bluntly pointed; third segment with the apical enlargement longer and stouter than the basal, stem of the basal enlargement slightly longer than that of the apical; fourth and fifth antennal segments similar to the third; terminal segment with the smallest of the basal enlargements. Mesonotum darkish brown. Scutellum paler; post-scutellum dark brown. Wings, hairy, short, almost hyaline; third vein meeting the costa at the apex of the wing. Legs scaly, hairy, dark brown; claws all simple; empodium as long as the claws. Abdomen, stout, oval, brown, about two-thirds the length of body. Genitalia (fig. 16) moderate in size; basal clasp segment basally lobed with a length thrice its own breadth; terminal clasp segment more slender, bifid at the well-chitinised tip, more than half the length of the basal; dorsal plate bilobed; ventral plate conical, dentate distally; style shorter than the basal clasp segment.

Locality: Trivandrum. No. $\frac{1125}{H\,8}$.

To show the relationship between the present species and the other known species of *Odontodiplosis* Felt, I modify Felt's key (1908) to the species of *Odontodiplosis* as follows:

I. Fifth antennal segment having the basal portion of the stem with a length about one to one and a half times its diameter
   - A. Abdomen reddish yellow . . . . . *O. karnerensis* (Felt)
   - B. Abdomen brown . . . . . *O. jonesi* sp. n.

II. Fifth antennal segment having the basal portion of the stem with a length two and a half or three times that of the diameter

A. Abdomen pale orange . . . . . *O. americana* Felt
B. Abdomen fuscous yellowish . . . . . *O. monatana* Felt

Trisopsis travancoricus sp. n.

This species is erected to receive specimens of midges collected at light from Trivandrum.

Male.—0·7 mm. long, brownish yellow. Eyes three, typical of the genus ; the dorsal third eye-group reniform. Palpi triarticulate, sparsely setose ; basal segment shortest, pyriform ; second segment cylindrical ; third longest. Antennae long, one and a half times longer than the body, with fourteen segments ; first segment anvil-shaped ; second segment pyriform, as long as the first ; third and fourth segments fused together, nearly equal ; the middle circumfila slightly shorter than the apical row ; the apical circumfila equal to the length of the stem ; third segment with the apical enlargement longer than the basal ; fifth segment slightly shorter than the fourth ; terminal segment shorter than the penultimate, apical enlargement cylindrical and bluntly pointed, nearly two and a half times longer than the almost rounded basal enlargement, the three circumfila loops nearly equal in length. Mesonotum brownish. Scutellum dark. Wings hyaline, long and narrow as in the genus. Halteres yellow. Legs slender, hairy ; claws simple on all legs, third pair of claws faintly dilated subapically ; empodium as long as claws. Abdomen about as long as body. Genitalia with the basal clasp segment not prominently lobed, roughly cylindrical, its broadest basal end about one-fourth as broad as long ; terminal clasp segment more slender, half as long as the basal, slightly bent, with the apex deeply bifid ; style prominent, longer than the basal clasp segment ; dorsal plate bilobed ; ventral plate simple and rounded.

Female.—0·8 mm. long, yellowish brown. Eyes with the characteristic triple division. Palpi triarticulate as in male. Antennae with fourteen segments ; segments constricted in the middle recalling the well marked binodose arrangement in the male. Flagellate antennal segments with stems ; terminal segment without a stem, but with a blunt conical tip, without any trace of a constriction in the middle. Wings as in the male. Legs hairy, claws small, simple ; empodium shorter than claws. Abdomen more than half the length of the body, yellowish brown with a dark tinge, hairy. Terminal lobes of ovipositor small, broadly oval.

Locality : TRIVANDRUM. *Male*—No. $\frac{1123}{H\,8}$. *Female*—No. $\frac{1124}{H\,8}$.

This species differs from the genotype in the comparatively smaller size of the body in both sexes ; the absence of a conspicuous conical prominence on the vertex ; the third vein reaching the wing margin at the apex ; and the terminal clasp segment with deeply bifid apex.

Itonida species A (sp. n. ?).

Several female specimens apparently belonging to the genus *Itonida* Meigen were present in Prof. M. S. Mani's collection sent to me. Since the collection does not include males the generic placement is only provisional. In order to facilitate future recognition of this midge it was felt desirable to place on record a complete description of the female.

Female.—3·5 mm. long. Eyes confluent above. Palpi quadriarticulate, sparsely setose ; first segment broad in the middle with a length about one and a half times its own thickness ; second segment as long as the first ; third segment clavate, longer ; fourth segment cylindrical, longest, twice as long as the first. Antennae with fourteen segments, flagellate antennal segments with two whorls of long setae, one basal and the other apical ; flagellate segments cylindrical, with triangular spines ; third and fourth segments fused together ; flagellate antennal segments with very short stems ; terminal segment short with apical end tapering to a point, the segments with binodose appearance by formation of faint constrictions in the middle, this feature disappearing towards the distal end ; the distal segments typically cylindrical. Fifth antennal segment with a stem less than one-fourth the length of the enlargement. Wings long and broad, moderately hairy, third vein united with the wing margin beyond the apex, as in the genus. Mesonotum blackish brown. Legs long and hairy ; claws simple ; empodium as long as claws. Abdomen reddish brown, about two-thirds the length of the body, comparatively stout. Terminal lobes of the ovipositor broadly oval.

Locality : Calcutta. No. $\frac{1126}{H8}$.

Three species of *Itonida* are known so far from India, viz. : *Itonida penniseti* Felt, *Itonida seminis* Felt and *Itonida paspalumi* Mani. The present species differs from the first two in that the stem of the fifth antennal segment of the female is less than one-fourth the length of the enlargement, and differs from the third in the relative length of the body.

Moreschiella erecta sp. n.

I refer to this species a single male specimen collected by me from Trivandrum, attracted to light. The generic placing of this species is provisional.

Male.—1·8 mm. long, reddish. Eyes confluent above. Head erect. Palpi quadriarticulate, sparsely setose ; first segment oval, three-fourths as thick as long ; second segment narrow distally ; third segment ovoid ; third and fourth segments equal in length ; fourth segment spatulate. Antennae with fourteen segments, one and one-fourth times as long as the body ; third and fourth segments fused together ; flagellate antennal segments with basal enlargements globose and the distal enlargements larger than the basal. Circumfila loops even, the loops longest in the distal row, the central row being the shortest ; stems of the enlargements longer towards the distal region of the antennae. First segment broadly conical ; second segment globose and slightly narrowed apically ; third segment with the stem of the basal enlargement about three-fourths as long as its thickness, the stem of the distal enlargement slightly longer, the distal enlargement one and one-fifth times longer than the basal ; terminal segment with the basal enlargement broadly pyriform, stem one and one-fourth times as long as its thickness, the apical enlargement tapering to a point and cylindrical. Wings hyaline, sparsely hairy, third vein meeting the costa at the apex. Halteres small, brownish. Legs hairy ; claws simple on all legs, as long as the empodium. Abdomen reddish, about half the length of the body. Genitalia (fig. 17) with the basal clasp segment cylindrical, with a basal ridge, about one-third as broad as long ; terminal clasp segment slender, slightly above two-thirds the length of the basal clasp segment, cleft at the tip ; style as long as the basal clasp segment ; dorsal plate divided and sparsely setose, longer than the ventral plate ; ventral plate short and compressed.

Locality : Trivandrum. No. $\frac{1127}{H8}$.

Octodiplosis fungivora sp. n.

This new species is erected to receive male and female midges bred from the larvae feeding on the spores of the fungus in galls on *Jasminum grandiflorum* Linn. Mani (1943) bred male and female midges from maggots feeding on spores of the rust fungus on *Andropogon sorghum* Brot., from Tanjore, and described them as *Cecidomyia sp. No.* 4. The present species is identical with Mani's *Cecidomyia No.* 4. Mani (1943) gives a complete description of the male and a partial description of the female. I name the species *Octodiplosis fungivora*.

The species is easily recognised by Mani's descriptions.

I add the following further notes about the female :

One mm. long. Palpi quadriarticulate ; first segment cylindrical ; second segment ovoid ; third segment fusiform ; fourth segment cylindrical, bluntly pointed at the tip, longest and thinnest, with a length double that of the first. Antennae with fourteen segments ; first two segments as in male ; flagellate segments cylindrical and with stems ; third and fourth segments fused together ; fourteenth segment with a terminal spatulate semi-segment, pointed at tip. Ovipositor with the basal lobes oval.

Locality : Venganur, near Trivandrum. Nos. $\frac{1128}{H\,8}$ and $\frac{1129}{H\,8}$.

It differs from *O. glyceriae* (Rübs.) in the third vein reaching the wing margin beyond the apex ; the antennae in the female with the terminal segments bearing a spatulate semi-segment ; and the ventral plate.

Acknowledgments.

I am greatly indebted to Prof. M. S. Mani, St. John's College, Agra, for the very valuable help that I received from him during my studies by way of critical suggestions, literature and specimens. My best thanks are due to Dr. H. F. Barnes, Rothamsted Experimental Station, for critically going through this paper and offering valuable suggestions. I am grateful to Mr. S. Jones and Mr. G. Renga Iyer for the collection of specimens and for the help rendered in rearing the midges.

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A REVISION OF THE EAST AFRICAN GENUS *ACROSTEGASTES* KARSCH, 1896 (ORTHOPTERA, ACRIDIDAE, CATANTOPINAE).

By D. Keith McE. Kevan, B.Sc., A.I.C.T.A., F.R.E.S.

This peculiar, nymph-like, brachypterous genus was erected by Karsch (1896) to contain two new species one from "Zanzibar" (*A. mollipes*) and the other from Somaliland (*A. glaber*), while a third species (*A. affinis*) was described, also from (Ogaden) Somaliland by Schulthess-Schindler (1898). The last species, however, is undoubtedly a synonym of *A. glaber*, so that the genus contains but two species which may be differentiated as follows :

Males.

1. Densely hairy all over, including pronotum. Tegmina almost as long as hind femur and almost reaching apex of abdomen . . . *A. mollipes.*
2. Only the legs very hairy, pronotum hairy only on the lateral margins. Tegmina at most under two-thirds the length of hind femur and only covering about half of the abdomen . . . . . *A. glaber.*

Females.

1. Hairy all over, even the pronotum and abdomen with a few scattered hairs. Puncturation of pronotum very rugose. Typical pronotal sulcus placed slightly before the middle, metazona more elongate. (Tegmina about two-thirds as long as hind femur) . . . *A. mollipes.*
2. Only the legs, pleura, sternum and clypeus slightly hairy. Pronotum quite glabrous ; puncturation less rugose. Typical pronotal sulcus placed slightly behind the middle, metazona less elongate. (Tegmina often less than two-thirds as long as hind femur) . . . *A. glaber.*

Only the male of the genotype, *A. mollipes*, and the female of *A. glaber* (and *A. affinis*) have been described, the latter quite inadequately. The females of the two species and the male of *A. glaber* will therefore be described below.

A. mollipes was described from a single male from "Sansibar," but it is not clear if this refers to the island or to the Sultan's dominions on the adjoining mainland. It has, however, recently been found on the mainland at Gasi, Kenya (04° 25′ S., 39° 30′ E.—May, 1944, E. Opiko *coll.*), but is apparently not known from elsewhere.

A. glaber and *A. affinis* were each described from single females, and although the type specimens are not available, sufficient material has been examined to show these to be synonymous, the former name having priority, although representing what is probably a less typical form.

In its description, *A. affinis* differs only from *A. glaber* in the number of internal spines on the posterior tibiae (a variable character), the lower and less

arcuate pronotal crest and the longer tegmina. The crest of the metazona in Karsch's figure may easily be somewhat exaggerated in height and convexity leaving only the length of the tegmina—a character of little value by itself—on which to separate the two species, since the pronotum, in any event, is subject to slight variations (see measurements below). Karsch's figure may possibly have been drawn from a slightly distorted specimen, such as one before the author, which resembles the figure closely.

A. glaber was described from Barawa (i.e. Brava, 01° 07′ N., 44° 02′ E.) on the Benadir coast (though from personal knowledge of the country, the writer considers that the specimen was taken a short distance inland from the coast on the landward side of the coastal dunes) and *A. affinis* from "Ueb" (Ogaden). [This latter locality means little, however, since it is merely the Somali word for "River," but apparently refers to the Webi Gestro and not to the upper Webi Shebelle, which was often referred to in the past as the "Uebi."] Thus the two type specimens were taken in the same region and in rather similar country, namely, the great desert-grass thorn-bush formation of the Horn of Africa. To this must be added the fact that Schulthess' *A. affinis* was taken by the writer at Modun, which is within five miles of the type locality (and perhaps even the exact locality) of *A. glaber*, and both forms have been taken together on the same day at Damassa on the north-eastern Kenya border.

No morphological difference other than tegmen-size is apparent in the females. One male from Damassa has slightly shorter tegmina than the majority and may possibly correspond to the female form described by Karsch. It has, if anything, a somewhat lower, and not higher, pronotal crest than usual; the male genitalia do not appear to differ.

It is therefore fairly clear that Karsch's and Schulthess' types represent forms of the same species and that *affinis* must fall, except possibly as a varietal name, no truly intermediate forms yet being known.

Apart from the type localities, the species has also been recorded from northern Somaliland or south-eastern Ethiopia (no data—Rehn, 1901). In Kenya it is known from desert-grass thorn-bush country near Wajir (01° 45′ N. 40° 05′ E., 790 ft.—11.xi.1946), at Damassa (03° 09′ N., 41° 20′ E., 1220 ft.—17.xii.1944, 19.xii.1944, 24.v.1947), Burki Dima Dar (03° 20′ N., 41° 25′ E., 1800 ft.—25.v.1944), Madagheddi (03° 43′ N., 41° 39′ E., 1300 ft.—24.v.1947), Birchika (03° 57′ N., 41° 38′ E., 1300 ft.—18.vi.1944), War Olia (02° 20′ N., 40° 33′ E., 1200 ft.—24.v.1947) and in desert grassland and scrub at Jaldessa Guda (02° 17′ N., 38° 18′ E., 1150 ft.—3. iii.1944); in the Ogaden (Somalia) from thorn-bush country near Argheile (05° 10′ N., 42° 05′ E., 1000 ft.—2.vi.1947); and near the Benadir coast (Somalia) among thorn-bush near Modun (01° 10′ N., 43° 59′ E., 200 ft.—23.ii.1947). The Wajir specimen was collected by Miss Z. Waloff (Anti-Locust Research Centre) and the remainder by the writer.

In addition to these localities, the British Museum collection contains several specimens from British Somaliland as follows: Baba Gob (09° 07′ N., 44° 30′ E. —Dec., 1946, *W. H. Wood*), Goolis Mts. (*E. L. Philips*, B.M. No. 98–215), "Br. Somaliland" (*W. A. Macfadyen*, B.M. No. 1929–398), and "Somaliland" (*G. W. Bury*, B.M. No. 1906–4).

The following are descriptions of the female of *A. mollipes* and the female and male of *A. glaber*:

Acrostegastes mollipes Karsch.

1896, *Acrostegastes mollipes* Karsch, *Stett. ent. Ztg.* **57** : 303, fig. 26.

♀ : KENYA : Gasi, Mombasa, May, 1944 (*E. Opiko*).[1]

Antennae.—Defective.

Head.—Very short, much higher than long, partially covered by anterior margin of pronotum, completely clothed with short, whitish hairs. Eyes small, oval, the interocular space one and a half times as wide as the height of an eye. Face vertical, strongly and rugosely punctate throughout. Frons broad, flat. Frontal ridge well defined but not very sharply differentiated from the rest of the face, ascending and meeting the vertex in a very widely rounded arc, very strongly and rugosely punctate throughout, very wide between the antennae (almost as wide as the height of an eye), suddenly narrowed below the median ocellus to less than half its width above it and gradually tapering towards the clypeus ; upper part of frontal ridge roughly quadrate. Lateral facial carinae straight, strong, converging somewhat towards the clypeus. Fastigium of vertex very broad and flatly rounded in front. Vertex coarsely and strongly punctured. Head, apart from frons and vertex, strumose ; median carinula present, but very indistinct.

Pronotum.—Strongly and rugosely punctate throughout and with a few scattered whitish hairs ; very strongly tectiform, strongly convex in profile anteriorly, less strongly posteriorly and somewhat swollen (compressed in the region of the typical sulcus) ; twice as long as wide ; two-thirds as high as long. Median carina strongly raised, lateral carinae obsolete. Anterior margin produced to form a short, broadly rounded process covering part of the occiput. Posterior margin more hairy than the rest of the pronotum, drawn out into a long, acutely pointed process which partly covers the tegmina. Posterior margin of dorsum continuing directly into that of the lateral lobes in a broad arc. Typical sulcus distinct, almost reaching the lateral margins and cutting the median carina a little before the middle. Two rather less distinct anterior pronotal sulci cutting the median carina about equal distances apart, the more posterior of the two running parallel to the typical sulcus and the more anterior converging on it, becoming indistinct on the lateral lobes. Lateral lobes not separable from the dorsum, but continuous with it ; lower margin hairy, broadly rounded.

Pleura.—Very strongly and rugosely punctured, hairy.

Sternum.—Broad, hairy. Prosternal tubercle strong, straight, acutely pointed, inclined forward. Mesonotal lobes broader than long, their interspace quadrate and rather less than the width of a lobe ; posterior margin of lobes directed obliquely backwards, the interno-posterior angles widely rounded. Metasternal pits strong and close together ; metasternal lobes broader than long, directed inwards and separated at their apices by a space about half the width of a lobe.

Tegmina.—Abbreviate, twice as long as wide, partly covered by the pronotum and reaching beyond the apex of the pronotal metazona to about the middle of the hind femur ; apices broadly rounded, meeting on the dorsum. Strongly and irregularly reticulate. Venation very reduced.

Hind wings.—Slightly shorter than tegmina, about as wide as long with distinct veins and cross-veins.

Legs.—Densely clothed with whitish hairs (particularly noticeable on hind tibiae). Anterior and middle tibiae with about three pairs of short spines within. First tarsal joint longer than second, the two together about equal to the third. Arolia and pulvilli well developed. Posterior femora stout, with the superior external area very wide, very strongly carinate. Superior and (more particularly) upper externo-median carinae strongly denticulate. Hind tibiae with 8 or 9 external and 9 internal spines. Inner pair of tibial spurs subequal, about equal in length to the superior (longer) spur of the outer pair.

[1] In the collection of the Coryndon Memorial Museum, Nairobi, Kenya.

Abdomen.—Finely punctured and with a few scattered hairs. Supra-anal plate slightly longer than wide, rounded apically and slightly sulcate medially at the base. Ovipositor valves short, strong, not denticulate, the upper pair considerably stouter than the lower pair. Cerci minute, conical.

Colour.—Unicolorous dull green except for the tibial spines, which are lilac, tipped with orange and black.

Measurements (in millimetres).—Length, 42 ; length, width and height of pronotum, 27, 13 and 18 respectively ; length of tegmen, 16 ; length and width of hind femur 23 and 7 length of hind tibia, 21.

The male has already been described more or less adequately by Karsch (*l.c.*).

Acrostegastes glaber Karsch.

1896, *Acrostegastes* (?) *glaber* Karsch, *Stett. ent. Ztg.* **57** : 304, fig. 27.
1898, *Acrostegastes affinis* Schulthess-Schindler, *Ann. Mus. civ. Genova* (2) **19** : 192. **Syn. nov.**
1901, *Acrostegastes affinis* Schulthess, Rehn, *Proc. Acad. nat. Sci. Philad.* **53** : 376.

Redescription of Female.

Antennae.—Filiform, not reaching to half length of pronotum.

Head.—Very short, much higher than long, partially covered by anterior margin of pronotum, glabrous except for a few minute white hairs on the clypeus. Eyes small, oval, anterior margin almost straight, the interocular space at least as wide as the height of an eye. Face vertical, rugosely punctate throughout (not quite so strongly as in the genotype). Frons broad, flat. Frontal ridge well-defined and rather more sharply differentiated from the rest of the face than in the genotype, ascending to meet the vertex in a very widely rounded arc ; rugosely punctate throughout, very wide between the antennae (about three-quarters as wide as the height of an eye), suddenly narrowed below the median ocellus to about half its width above it, gradually tapering towards and reaching the clypeus, the upper portion being more or less quadrate. Lateral facial carinae usually indistinct, straight, converging slightly towards the clypeus. Fastigium of vertex very broad and flatly rounded in front. Vertex rugosely punctate. Head, apart from face and vertex, strumose. Median carinula very weak or entirely absent.

Pronotum.—Rugosely punctate throughout (less strongly than in the genotype), completely glabrous, very strongly tectiform, strongly convex in profile anteriorly, less so posteriorly, somewhat swollen, scarcely, if at all, compressed in the region of the typical sulcus (*A. mollipes* is distinctly compressed), slightly less than twice as long as wide, three-quarters as high as long. Median carina strongly raised, lateral carinae obsolete. Anterior margin produced to form a short, broadly rounded process partly covering the occiput. Posterior margin drawn out into a long, acutely pointed process which partly covers the tegmina, the posterior margin of the dorsum continuing directly into that of the lateral lobes in a broad arc. Typical sulcus distinct, almost reaching the lateral margins and cutting the median carina a little behind the middle. Two (often less distinct) anterior sulci cutting the median carina about equal distances apart, the more posterior of the two being almost parallel to the typical sulcus and the more anterior converging on it and becoming indistinct on the lateral lobes. Lateral lobes not separable from dorsum, but continuous with it.

Pleura.—Rugosely punctate, glabrous but for a few minute scattered hairs.

Sternum.—Broad, slightly hairy. Prosternal tubercle strong, straight, acutely pointed, slightly inclined forwards. Mesosternal lobes about as broad as long, their interspace very slightly wider than long, very slightly less than the width of a lobe ; posterior margin of mesosternal lobes directed obliquely backwards, the interno-posterior angles widely

rounded. Metasternal pits strong and close together. Metasternal lobes broader than long, directed inwards and separated at their apices by a space about half the width of a lobe.

Tegmina.—Abbreviate with broadly rounded apices, less than twice as long as wide, partly covered by the pronotum. Length variable, usually reaching beyond the apex of the metazona of the pronotum to just short of the middle of the hind femur (f. *affinis*), their apices meeting on the dorsum, but sometimes not reaching beyond the apex of the

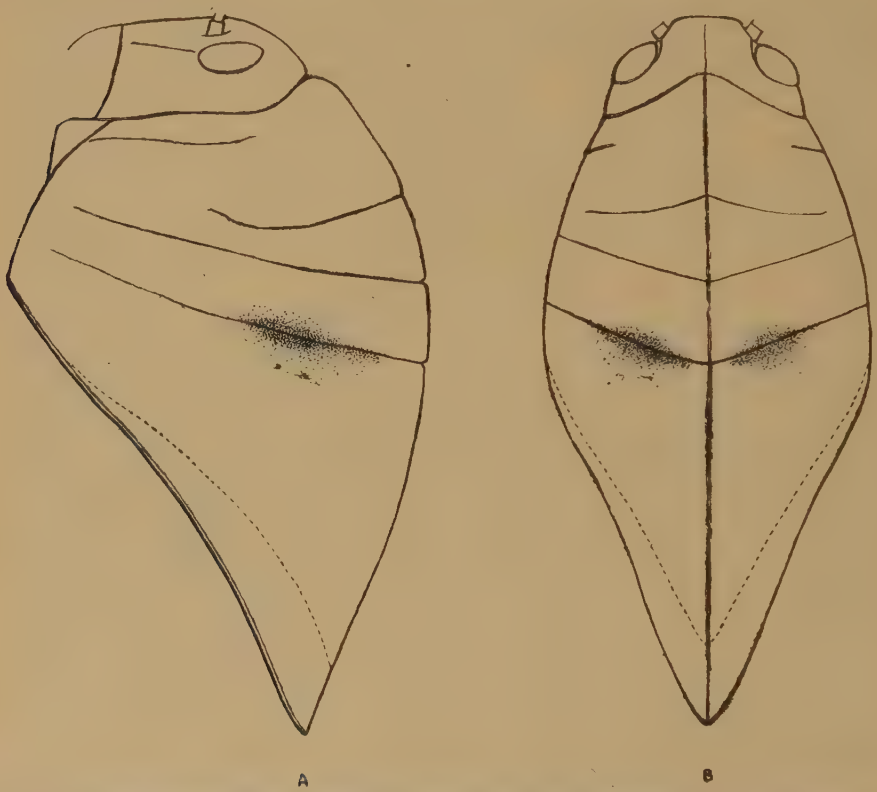

FIG. 1.—*Acrostegastes mollipes* Karsch. Female, head and pronotum × 3. A, lateral; B, dorsal. (Broken line indicates approximate outline of *A. glaber*.)

metazona and only to just beyond the base of the hind femur (f. *glaber*), their apices widely separated on the dorsum. Irregularly reticulated and with reduced venation.

Hind wings.—Slightly shorter than tegmina, about as wide as long, with distinct veins and cross-veins.

Legs.—With a few short, scattered hairs. Anterior and middle tibiae with three pairs of short spines within. First tarsal joint longer than the second, the two together about equal to the third. Arolia and pulvilli well developed. Posterior femur stout, with superior external area wide, strongly carinate, the superior and the upper externo-median carinae denticulate. Hind tibiae with 8 to 11 external and 10 to 11 internal spines. Inner tibial spurs slightly longer than the outer, the upper one of each pair the longer.

Abdomen.—Glabrous with a few small punctures towards the apex. Supra-anal plate about as long as wide, slightly sulcate basally and with the posterior margin obtuse-angulate,

the apex very slightly acuminate. Ovipositor valves stout, strong, not denticulate, the upper pair considerably stouter than the lower. Cerci minute, conical.

Colour.—Unicolorous pale green or testaceous or occasionally of both colours in large indefinite areas. Antennae usually testaceous. Tibial spines dark green, occasionally light brown or even grey-lilac in testaceous specimens, tipped with black.

Measurements. (See table.)

Description of Male.

♂ : KENYA : Damassa, Mandera Distr., lat. 03° 09′ N., long. 41° 20′ E., desert grass and thorn-bush, 19.xii.1944 (*D. K. Kevan*).

Antennae.—Filiform, about same length as pronotum.

Head.—Similar to that of female, but differs as follows. Whole head, not clypeus alone, with a few short, scattered, whitish hairs. Eyes larger, the interocular space not quite so wide as the height of an eye. Frontal ridge narrower, only about half the width of the height of an eye with the upper portion distinctly longer than wide. Lateral facial carinae much more distinct and more vertical. Fastigium of vertex truncate and not flatly rounded, as seen from above.

Pronotum.—Similar to that of the female, but with a few scattered hairs on the lateral margins.

Pleura and *sternum.*—Similar to female.

Tegmina.—Abbreviate, with broadly rounded apices covering about half the abdomen and meeting on the dorsum, about half as long as hind femur, but not reaching much beyond one-third of its length. (In other examples, the tegmina are about two-thirds as long as the hind femur—f. *affinis*—see measurements.) Irregularly reticulate, but less irregularly than in the female.

Hind wings.—Similar to those of female.

Legs.—Similar to those of female, but distinctly more hairy, with 10 external and 10 internal posterior tibial spines. (One other example has only nine external spines.)

Abdomen.—Similar to that of female, but with abdominal sterna hairy. Last tergum emarginate. Supra-anal plate slightly broader than long, sulcate basally, posterior margin obtuse-angulate, the apex acuminate. Cerci short, conical, barely half as long as supra-anal plate. Subgenital plate rounded, hairy.

Colour.—Green ; eyes brown ; antennae purplish brown ; posterior margin of pronotum very narrowly pale yellow ; tegmina sepia-brown except for the anal area, which is pale yellowish white ; upper externo-median carina of hind femora sepia-brown ; hind tibiae purplish, tibial spines lilac, tipped with orange and black.

Measurements. (See table.)

The appended table of measurements is presented in extended form with the object of showing the variability of the pronotum, tegmina and tibial spines. Those marked with an asterisk conform to the true *glaber* type, while the others belong to what might be called var. *affinis*.

Biological Note.

A. glaber has always been found in arid country and, except for one case, in a desert-grass acacia-thorn association. It has been noticed repeatedly, however, that Malvaceous plants and shrubs seem to be preferred, and, even when specimens have not been captured on them or among them mixed with other vegetation, there always seem to have been MALVACEAE at no great dis-

Table of Measurements of A. glaber (*in millimetres*).

(l. = length ; w. = width ; h. = height ; no. = number.)

Station	Total l. (abdomen usually bent)	Pronotum l.	Pronotum w.	Pronotum h.	l. of tegmen	l. of hind femur	No. of tibial spines in	No. of tibial spines out
♀ Damassa (19.xii.44)*	34	20	11·5	14·5	6·5	18	10	9
♀ Burki Dima Dar*	34	16 (slightly distorted)	10	13	6	16	10	10
♀ Baba Gob*†	28	17	10	12	6	16	10	10
♀ Type (*A. glaber*)*	36	21	—	—	8	20	11	9
♀ Jaldessa Guda	42	20	12·5	15	12	20	10	10
♀ Damassa (19.xii.44)	36	17·5	10·5	13	11	—	—	—
♀ „ (17.xii.44)	30	15	9	11	10	16	10	8
♀ „ (24.v.47)	41	21	12	15	12·5	20	10	9/10
♀ „ („)	36	17	10·5	13	11·5	17	10	10
♀ Birchika	36	19	12	14·5	13	19	10	9
♀ Madagheddi	46	20	11·5	15	12	20	10	10
♀ War Olia	damaged	18	10·5	13	10·5	17	10	10
♀ Modun	34	18·5	11	14	12	20	10	10
♀ Argheile	33	22	12	15	12	21	10/11	10/11
♀ "Somaliland"	32	21	11·5	13	10·5	17·5	10	10
♀ „	31	19·5	10·5	13	11	17	10	10
♀ Goolis Mts. (somewhat teneral)†	29	18	9·5	11·5	10	15	10	10
♀ "Br. Somaliland"†	23	14	8	10	7·5	14	10/11	10
♀ Type (*A. affinis*)	37	17	—	—	11	17	10	9
♂ Damassa (19.xii.44)*	21	9·5	6	7	7·5	14·5	10	10
♂ „ (24.v.47)	22	10	6·5	8	9	15	10	9
♂ „ („)	24	11	7	8	10	15·5	10	10
♂ „ („)	21	9·5	5·5	6·5	8·5	13	10	10
♂ „ („)	24	11	7	8	10·5	15·5	10	10
♂ Wajir	23	11	7	8	10	15·5	10	10

† Slightly distorted and shrunken by fixative.

tance. One male was taken, not on ground cover, but on a thorn tree (above eye-level). This is considered to be unusual.

Although flightless, the insect leaps several feet at a time, one leap by a male being measured as approximately seven feet.

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FURTHER NOTES ON THE ETHIOPIAN SPECIES OF *TAENIORHYNCHUS* ARRIBALZAGA (DIPTERA, CULICIDAE).

By J. D. Gillett

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In a recent communication (Gillett, 1946) I described eight species of the subgenus *Coquillettidia* Dyar of the genus *Taeniorhynchus* Arribalzaga, including what I held to be a new species. Recent references to the specimens in the British Museum has shown that *Taeniorhynchus atroapicalis* Gillett is identical with *Chrysoconops fraseri* Theobald, which was sunk by Edwards (1912) as a synonym of *T. aurites* Theobald. It is the object of the present paper to define the present status of this species and to add a few remarks about some of the other species of Ethiopian *Taeniorhynchus*.

It is known that most of the species of *Coquillettidia* resemble each other very closely, especially in their aquatic stages. Hopkins (1936) pointed out that the larvae of *T. aurites* and of *T. microannulatus* Theo. were quite indistinguishable. Gillett (1945, 1946) showed that the Ethiopian larvae of the subgenus so far described fall into two groups, *viz.* those with tuft B of the eighth abdominal segment single and those with tuft B double. He also pointed out that other good differences were to be found in the antennae.

T. atroapicalis was first separated on larval characters and was found to be even more distinct in the pupal stage, the shape of the paddles being markedly different from those of all the other known Ethiopian species. A series of adults was bred out which resembled those of *T. aurites* in general characters, including the male terminalia,[1] but both sexes were readily separable by the fact that in *T. atroapicalis* all the femora had a well marked dark apical ring which was entirely wanting in *T. aurites*. Hence it was clear that here was a species that did not fit any of the descriptions of adults given by Edwards (1941) and which differed in its early stages from all other known Ethiopian *Taeniorhynchus*.[2] In addition to these constant and non-intergrading morphological differences it may be mentioned that the behaviour on pupation of *T. atroapicalis* and *T. aurites* differs markedly. The latter species invariably leaves its larval pelt turned nearly inside out, a peculiarity which (as far as is known) it shares only with *T. microannulatus* amongst the Ethiopian *Coquillettidia*. Individuals of *T. aurites* from widely separated parts of Uganda all behave in this way, whereas those of other Ethiopian species, including *T. atroapicalis*, leave the larval pelt somewhat telescoped.

Theobald (1911) described *Chrysoconops fraseri* from one female and two males taken at Kampala, Uganda. He separated it from *T. aurites*, which he had also described (Theobald, 1901), by the presence in the former species of a

[1] It should be noted that the male terminalia of *T. nigrithorax*, *T. flavocinctus*, *T. fuscopennatus*, *T. grandidieri* and *T. aurites* are all very similar.

[2] Another difference, which is discussed below, was not observed at the time because Edwards' combination of the two species *T. aurites* and *C. fraseri* meant that he included one of the key characters of the latter species in his description of the former.

black dot at the posterior corner of the first abdominal tergite. As stated above, Edwards (1912) considered Theobold's *C. fraseri* to be synonymous with *T. aurites*.[3] It should be remembered that the larva of neither species was known at that time. In his later description (Edwards, 1941) of *T. aurites* no characters are given for the "*fraseri* form" of *T. aurites*, *C. fraseri* being mentioned as a synonym only.

The description of *T. atroapicalis* by Gillett (1946) fits Theobald's type specimen of *C. fraseri* and the two names are synonymous. It is clear that *C. fraseri* should be reinstated as *Taeniorhynchus* (*Coquillettidia*) *fraseri* Theobald.

On going through the material labelled *T. aurites* in the British Museum it was noted that there were several specimens of *T. fraseri* (= *atroapicalis*) included as *T. aurites*. Examination of the geographical distribution of these shows that populations of the two species overlap. The distribution of *T. aurites* given by Edwards (1941) still holds and *T. fraseri* occurs with it at Kampala and Entebbe in Uganda, and at Stanleyville in the Belgian Congo. In addition I have taken both species from Masaka in Uganda. In the British Museum there is also one rather doubtful specimen recorded from Lourenço Marques in Portuguese East Africa, which resembles *T. fraseri* but has no dark apical ring on the front femur.

When Hopkins (1936) bred out and described the larva and pupa of *T. aurites* he sent a number of the larval and pupal pelts, together with their respective adults, to the British Museum. Recent examination of this material has revealed that both *T. aurites* and *T. fraseri* are represented, and by a stroke of bad luck, which at the time was wholly unavoidable, the larval pelt, pupal pelt and adult which he designated as the paedotype all belong to *T. fraseri*. It is now known, then, that Hopkins had taken the larvae of both species and had reared them through to adult stage, but as *T. fraseri* was at that time considered only as a form of *T. aurites* he had designated them all as *T. aurites*.[4] The fact that both species were represented in this material led Edwards (1941) to describe the pupa of *T. aurites* as being "subject to some variation." It is, in fact, subject to very little variation. The difficulties which have arisen out of Hopkins' description of the larva of *T. aurites* have been dealt with by Gillett (1945, 1946).

In view of this somewhat confusing situation a new key to the adults of the Ethiopian species of *Taeniorhynchus* seems desirable, and new descriptions with complete synonymies of the adults of *T. aurites* and *T. fraseri* are called for. The key which follows is based on that given by Edwards (1941), but incorporates certain changes, including those made necessary by the situation discussed above.

Key to the adults of the Ethiopian species of *Taeniorhynchus*.

1. Wing-scales narrow; tarsi without white rings (*Coquillettidia*) . . . 2.
   Wing-scales very broad; tarsi with white rings (*Mansonioides*) . . 17.
2. Dark metallic species; (scutum with pale scales anteriorly); tarsi and wing-scales uniformly black . . . . . *metallicus*.
   Lighter species; tarsi and wing-scales partly yellow . . . . . 3.

[3] Theobald (1907) transferred his *T. aurites* to the genus *Chrysoconops* Goeldi.

[4] Mr. Hopkins, who has seen this paper in draft, points out that this is exactly the type of case against which his suggestion of paedotypes was directed as a safeguard. He considers that the adult and its larval and pupal pelts now become the paedotype of *T. fraseri*.

3. Brownish species; abdomen with broad dark bands; costa dark *versicolor.*
   Lighter species; at least the abdomen largely or all yellow; costal scales partly or all yellow . . . . . 4.
4. Thoracic integument yellow or green, with dark marks on pleurae . 5.
   Thoracic integument otherwise . . . . . 7.
5. A pair of patches of black scales on anterior half of mesonotum *pseudoconopas.*
   Scales on anterior half of mesonotum uniformly golden . . . . 6.
6. Dark scales on wings *tending* to form two transverse bands; male styles without expansion . . . . . *maculipennis.*
   Wing-scales more uniform; male styles with expansion near apex *annetti.*
7. Thoracic integument very dark and shining; abdomen yellow . . 8.
   Thoracic integument at most brownish above . . . . . 10.
8. Tibiae all blackish . . . . . *nigrithorax.*
   Tibiae not all blackish . . . . . 9.
9. Hind tibia black with a yellow ring beyond middle . . . *flavocinctus.*
   Hind tibia yellow with a black ring in middle . . . . . *cristatus.*
10. Mesonotum largely brown; wing-scales extensively dark . *fuscopennatus.*
    Thorax rather bright orange-yellow, like the abdomen . . . . 11.
11. Hind tibia with a black ring in middle . . . . . 12.
    Hind tibia yellow, without black ring in middle . . . *microannulatus.*
12. Costa with some dark scales on basal half . . . . . *grandidieri.*
    Costal scales all yellow . . . . . 13.
13. Hind tarsi with about the distal third of first segment black; fourth segment yellow at base . . . . . 14.
    Hind tarsi with about the distal fifth of first segment black; fourth segment all black above . . . . . 15.
14. Male styles with very large median lobe . . . . . *aureus.*
    Male styles with membranous expansion near tip . . . . . *wahlbergi.*
15. Males styles with membranous lobe . . . . . 16.
    Male styles simple . . . . . *chrysosoma.*
16. Dark apical ring on all femora; first tergite with a black dot at each posterior corner . . . . . *fraseri.*
    No dark apical ring on femora; no black dots on first tergite . *aurites.*
17. Pale scales on thorax arranged in patches; tibiae with separate white spots anteriorly . . . . . *africanus.*
    Pale scales on thorax arranged in stripes; tibiae with confluent creamy-white patches anteriorly . . . . . *uniformis.*

In the keys given by Gillett (1946) to the known larvae and pupae of the Ethiopian species of *Coquillettidia* the word "*fraseri*" should be substituted for "*atroapicalis.*"

Taeniorhynchus (*Coquillettidia*) *aurites* Theobald.

Taeniorhynchus aurites Theobald, 1901, *Mon. Cul.* **2**: 209; Edwards, 1911, *Bull. ent. Res.* **2**: 252 and, partim 1941, *Mosq. Eth. Reg.* **3**: 99.
Chrysoconops aurites Theobald, 1907, *Mon. Cul.* **4**: 493.
(?) *Taeniorhynchus auripennis* Edwards (♂ only), 1915, *Bull. ent. Res.* **5**: 279.

TYPE.—♀ in B.M., NIGERIA, Bonny.

A large bright yellow species; thorax and wings entirely yellow; legs mainly yellow, including apex of all femora, but with a distinct black ring in middle of hind tibia, as in several related species. Fourth hind tarsal segment all black.

♀. *Head* yellow, including clypeus, tori and all scales. Proboscis yellow, narrowly black at tip and at base beneath. Palpi yellow, usually with a few black scales at tip, but these sometimes absent.

Thorax bright yellow, including mesonotal scales and bristles; two large patches of white scales present on the pleurae, one in the middle of the sternopleura and the other in the middle of the mesepimeron; integument underlying these white pleural scales somewhat darkened. In addition, a very small and much less conspicuous patch of white scales lower down on the posterior border of the sternopleura.

Abdomen bright yellow, often with a few black scales which are apt to be most numerous towards posterior margins of tergites 2–4. Small black patches on the integument at posterior corners of tergites 2–5, usually only clearly visible when the abdomen is distended; no black dots on posterior corners of tergite 1.

Legs yellow, with only a few scattered black scales on femora and on anterior tibia; apex of all femora yellow; hind tibia with a narrow black ring in middle and very narrowly black at tip. Front tarsi variable, but usually with first segment yellow except for black tip; second segment yellow with apical third or half black; third, fourth and fifth segments all black; (front tarsi much more extensively yellow in some specimens). Middle tarsi variable, usually all yellow except for fifth segment, which is all black, but sometimes with a black tip to segments 1–4. Hind tarsi with first segment yellow except for black tip occupying from a sixth to a quarter of its length; second segment yellow with distal half black; third, fourth and fifth segments all black (third yellow at base in some specimens).

Wings yellow-scaled, with very occasionally a few dark scales present, especially on sixth vein.

♂. Ornamentation as in ♀. Palpi exceeding proboscis by length of last segment; yellow; with a few black scales at tip of shaft and more at tip of penultimate segment; most of terminal segment black, plumes yellow. Abdominal tergites 2–4 sometimes with narrow black bands or triangles.

Terminalia.—Style with a membranous expansion in middle, somewhat larger and more hairy than that of *T. fuscopennatus*.

Wing-length about 5 mm.

Distribution.—Nigeria: Bonny (*Annett*); Lagos (*Philip*, *Graham*). Gaboon: Fernan Vaz (*Gallliard*). Uganda: Kampala (*Hancock*, *Hopkins*); Entebbe (*Hodges*, *Gillett*); Masaka (*Gillett*). Belgian Congo: Stanleyville and Lake Albert (*Schwetz*); Sandoa (*Chaussier*); Futwe and Mwabo (*Seydel*).

Taeniorhynchus (*Coquillettidia*) *fraseri* Theobald.

Chrysoconops fraseri Theobald, 1911, *Novae Cul.*: 22.
Taeniorhynchus aurites Edwards (nec Theobald), partim, 1912, *Bull. ent. Res.* **3**: 25, and 1941, *Mosq. Eth. Reg.* **3**: 99.
Taeniorhynchus atroapicalis Gillett, 1946, *Bull. ent. Res.* **36**: 436.
Taeniorhynchus aurites Hopkins (nec Theobald), partim, 1936, *Mosq. Eth. Reg.* **1**: 83.

Types.—♂♀ in B.M., Uganda, Kampala.

A medium-sized bright yellow species resembling *T. aurites*, from which it may at once be separated by its dark-tipped femora, the presence of small black dots on the posterior corners of the first abdominal tergite and its smaller size.

♀. *Head* yellow; erect and decumbent scales pale yellow; tori and clypeus orange yellow; proboscis yellow, with black tip and narrow black base beneath; palpi yellow, with broad black tips (reduced to a few scattered black scales in one specimen).

Thorax with yellow integument; scutum with a scanty covering of bright yellow scales, which tend to be arranged in longitudinal lines. Three patches of white scales on the pleurae, in the middle of the sternopleura, on the posterior margin of the lower part of the sternopleura and on the mesepimeron; those on the middle of the sternopleura and mesepimeron smaller than those in *T. aurites*, and with scarcely any darkening of the integument beneath.

Abdomen mainly yellow, but with a few scattered black scales often tending to form black triangles on the posterior margins of tergites 2–4. Small black dots on the posterior corners of tergite 1, and black patches on the postero-lateral corners of tergites 2–6. Sternites mainly yellow, but with black scales tending to form posterior dark bands.

Legs mainly yellow; femora yellow with numerous scattered black scales (these scales moderately numerous on the distal half only of front and hind femora, but very numerous for the full length of the middle femur) and a well marked dark apical ring (sometimes less conspicuous on the front femur). Front and middle tibiae with numerous scattered black scales, and a dark apical ring; the scattered black scales are almost entirely restricted to the anterior surface of the middle tibia, where they generally form an almost complete black line extending for two-thirds the length of the tibia. Hind tibia with an apical black ring, a black ring just beyond the middle and a few black scales at the extreme base. Front tarsi with first segment yellow except for black tip; second segment yellow, with apical third black; third, fourth and fifth segments all black. (The basal half of the third segment is yellow in a few specimens.) Middle tarsi all yellow except for fifth segment, which is all black; in some specimens there is a slight darkening at the apices of segments 1–4. Hind tarsi yellow, with distal quarter of first segment black, distal half of second segment black, distal two-thirds of third segment black, fourth and fifth segments all black. No variation has been observed in the hind tarsi, which thus differ from those of *T. aurites*.

Wings all yellow; occasionally a few scattered dark scales on the sixth vein.

♂. Ornamentation as in ♀. Palpi mainly yellow; tip of shaft black-scaled; distal half of penultimate and whole of terminal segments black-scaled; plumes yellow.

Terminalia.—Style with median membranous expansion as in *T. aurites*.

Wing-length about 4 mm.

Distribution.—Uganda: Kampala (*Fraser*, *Baker*, *Hancock*, *Hopkins*); Entebbe (*Hodges*, *Gillett*); Masaka (*Gillett*). Belgian Congo: Stanleyville (*Schwetz*).

Summary.

In 1912 *Chrysoconops fraseri* Theo. was sunk by Edwards as a synonym of *Taeniorhynchus aurites* Theo. In 1946 Gillett described the larva, pupa and adult of *T. atroapicalis*, which was shown to be clearly distinct from *T. aurites* in all three stages.

Comparison of *T. atroapicalis* with the type specimen of *C. fraseri* shows them to be identical. Theobald's species is therefore reinstated as *Taeniorhynchus fraseri* Theo., with *T. atroapicalis* as a synonym.

Notes are given on the geographical distribution of *T. aurites* and *T. fraseri*, together with some observations on their larvae and pupae.

An amended key is given for the adults of the Ethiopian species of *Taeniorhynchus* and full new descriptions of the adults of *T. aurites* and *T. fraseri*.

I am indebted to the Trustees of the Britsh Museum for permission to look through the material, and to Messrs. R. B. Freeman, P. F. Mattingly and G. H. E. Hopkins for many helpful suggestions.

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BOOK NOTICE.

The Butterflies and Moths found in the Counties of Cheshire, Flintshire, Denbighshire, Caernarvonshire, Anglesey and Merionethshire. Compiled and edited by S. Gordon Smith. 8vo. Chester (Chester Society of Natural Science, Literature and Art), 1948. Pp. 250. 17 pls. Price 15s. 6d.

The author in his preface to this work says that his aim has been to bring up to date the list of records of Macro-Lepidoptera, including the Zygaenidae, Cossidae, Sessiidae and Hepialidae, which have been found in the counties of Cheshire, Flintshire, Denbighshire, Caernarvonshire, Anglesey and Merionethshire.

To this end the records of over 130 entomologists and earlier published records have been embodied to make the work as comprehensive as possible.

The arrangement is by families, each genus being listed under its subfamily, and the species numbered consecutively through the book. The English names are given for each species, followed by a general indication of the abundance and habitat of the insect. This is followed by the records for each county.

The book is illustrated by 17 half-tone plates, most of the specimens shown being in the author's collection.

An index of families, subfamilies, genera, species and English names completes the book.

A REVIEW OF THE ETHIOPIAN SPECIES OF *CHELONOMIMA* (DIPTERA—STRATIOMYIIDAE), WITH NOTES AND DESCRIPTIONS OF OTHER AFRICAN PACHYGASTRINAE.

By Maurice T. James.

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The present paper is based largely on material sent to me for identification by the Commonwealth Institute of Entomology. Types of species described herein as new will become the property of the British Museum (Natural History).

Chelonomima Enderlein.

Chelonomima Enderlein, 1914, *Zool. Anz.* **43** : 312–313 ; Kertész, 1914, *Ann. Mus. nat. Hung.* **12** : 508–510.

Genotype, *C. partiticeps* Enderlein, by monotypy.

Three of the four previously described species of this genus are from the Ethiopian Region, the fourth being *C. signata* de Meijere, from Sumatra. The following key will serve to separate the Ethiopian species. Of these I have not seen *C. proloxocera* Speiser, and consequently have had to place it on the basis of its original description.

1. Wing smoky brown on apical part beyond stigma and along posterior margin ; head and thorax variegated brownish black and creamy white, the brown mesonotum contrasting strongly with the cream-coloured pleura . . . . . *proloxocera* Speiser
   Wing except stigma uniformly hyaline ; head and thorax yellowish, variegated with brown, blackish brown, or black ; mesonotum not strongly contrasting in color with the pleura . . . . . 2.
2. Mesonotum on each side with a broad sublateral brownish to blackish vitta extending from behind humerus to apex of, and including the broad sides of, the scutellum . . . . . *notata* Lindner.
   Mesonotum, if with paired sublateral dark vittae, also with a prominent median area of the same color ; scutellum at most slightly darkened laterally . . . . . 3.
3. Mesonotum usually entirely bright yellow ; all tarsi usually wholly yellow ; abdomen nearly as broad as thorax, the sides not reflexed ; fourth tergite and posterior part of third blackish, abdomen otherwise, except female genitalia, chiefly yellow . . *partiticeps* Enderlein.
   Mesonotum extensively brownish black, especially in male ; last two or three segments at least of each tarsus blackish ; abdomen much narrower than thorax, the sides reflexed ; abdomen extensively blackish, particularly beyond the third segment . . . **gracilis** sp. n.

Chelonomima proloxocera Speiser.

Chelonomima proloxocera Speiser, 1922, *Zool. Anz.* **54** : 133.

The type series consists of several specimens from Douala, Cameroons. Speiser does not indicate the sex of his specimens, but apparently they are all females.

Chelonomima notata Lindner.

Chelonomima notata Lindner, 1939, *Ruwenzori Expedition*[1] 1934–5, 2 (1–2) : 7 Brit. Mus. (N.H.); 1938, *Bull. Mus. roy. Hist. nat. Belg.* **14** : (54) 32.

Lindner originally described this species from a male from Bwamba Pass, Ruwenzori; in his 1938 paper he recorded it, also on the basis of a male, from Lulenga, N. Kivu. I have examined the following material: 1 female, W. Ruwenzori, 6000 ft., July, 1945 (*van Someren*); 2 males, W. Ruwenzori, 8–9000 ft., July, 1945, and July, 1946 (*van Someren*).

Chelonomima partiticeps Enderlein.

Chelonomima partiticeps Enderlein, 1914, *Zool. Anz.* **43** : 313, fig. 17, 18; Kertész, 1914, *Ann. Mus. nat. Hung.* **12** : 509, fig. 38, 39, 40; Lindner, 1938, *Bull. Mus. roy. Hist. nat. Belg.* **14** (54): 32; Lindner, 1938, *Mitt. Deut. ent. Ges.* **8** : 77.

Described from Fernando Po and subsequently recorded from Sierra Leone, Belgian Congo, and "Westafrika." I have examined the following material: 3 males, 1 female, Bwamba, April, 1944, and July to Aug., 1946 (*van Someren*); 1 female, Njala, Sierra Leone, Sept. 19, 1932 (*E. Hargreaves*); and 1 male, Nyasaland (*R. C. Wood*), all in the collection of the British Museum (Natural History); and 1 male, 1 female, Monrovia, Liberia (my collection).

According to Kertész, this species is variable in regard to such characters as the ratio between the length of the first and second submarginal cells and the coloration of the mesonotum, abdomen, and legs. It seems, however, that Kertész' material may have involved more than one species.

Chelonomima gracilis sp. n.

Female.—An elongated, slender species. Head 1·5 as wide as long; occiput, as viewed from above, transverse, the orbits broadly rounded; frons parallel-sided, about one third as wide as head; antennae twice length of head. Head yellowish, occiptal orbits on upper half and frontal orbits to near base of antennae brownish; head with scattered whitish hairs; terminal segment of palpus shining black; antenna yellow on basal three segments, otherwise blackish, rather densely haired.

Thorax, including scutellum, almost twice as long as wide; mainly yellow, a large median, poorly defined area before the suture, connected with a pair of narrow sublateral stripes, also poorly defined, which are interrupted at the suture and which terminate before the scutellum, brownish. Pectus on each side of median line brownish; a small, indistinctly defined whitish spot on each mesopleuron before the wing base.

Legs elongated; hind tibia spatulate; fore and hind coxae, hind tibiae and last three segments of all tarsi, brownish black; fore tibia, except basally, middle tibia and second and apical half of first segments of hind tarsus brownish; legs otherwise yellow. Wings hyaline except stigma, which is almost black; first submarginal cell slightly shorter than second; vein R_4 slightly oblique. Halteres yellow, knobs brownish.

Abdomen elongated, five times as long as wide, about three-fifths as wide as thorax; sides distinctly reflexed. Tergites, except narrow apex of first and broader base of sixth, blackish; sternites, except on ovipositor, yellow; ovipositor, including cerci, shining black.

Length 6 mm.

[1] Lindner's *Ruwenzori Expedition* paper was delayed in the press, so that the record from Kivu antedated the first published description by several months, and is a *nomen nudum*. [H.O.]

Male.—Eyes narrowly but distinctly separated. Occiput on upper half, except median stripe, ocellar triangle, and cheeks black. Dark coloration of thorax more intense and more extensive than in the female ; brown areas of mesonotum almost black anteriorly ; anterior margin of each mesopleuron and a triangular spot in front of the whitish spot before the wing base brownish ; metapleura and postscutellum brownish. Abdomen wholly brownish black dorsally and becoming brownish toward apex ventrally. Length, 6 mm.

Holotype.—Female, Bwamba, April, 1944 (*van Someren*). *Allotype*-male, Bwamba, July to August, 1946 (*van Someren*).

This species differs from *C. partiticeps* not only in coloration but also structurally. In form it is much more slender ; the occiput is transverse in both sexes ; in the male, the occipital orbits, though narrow, are present, and the eyes are narrowly separated ; in the female the orbits are much more evenly rounded (consequently not so angular when viewed from above) and are more prominent below. Vein R_{2+3} is more strongly oblique, making the first submarginal cell longer in proportion along R_{4+5} as compared with *C. partiticeps* ; this addition in length is to an extent compensated for, however, by the slight obliqueness of vein R_4.

Diplephippium Speiser.

Diplephippium Speiser, 1908, *Berlin. ent. Zeit.* **52** : 142.
Genotype, *D. amphicentrium* Speiser, by monotypy.

Two known species have been referred to this genus, the genotype and *D. tessmanni* Grünberg. The following key will serve to separate them.

Medium-sized species (9–11 mm. in length) ; mesonotum uniformly punctured ; veins M_1 and M_2 separated at their bases by a crossvein *tessmanni* Grünberg.

Small species (6 mm. in length) ; mesonotum with anterior margin and median line devoid of punctures ; veins M_1 and M_2 arising together at apex of discal cell . . . . . *amphicentrium* Speiser.

Diplephippium tessmanni Grünberg.

Diplephippium tessmanni Grünberg, 1915, *Mitt. zool. Mus. Berlin* **8** : 57.

This species was described from a male from Benito, Rio Muni, Africa (" Benitogebiet, Spanisch-Guinea "). The following specimen, in spite of its geographical remoteness from the type locality, seems to be the female of the same species. It differs from the male only in the usual sexual characters and in the coloration, which in this family often varies considerably with the sexes.

Female.—Front at vertex about 0·35 head height, broadening to about half head height at base of antennae ; face almost parallel-sided. Head chiefly reddish brown, the ocellar triangle, facial orbits, middle of face, and occiput on upper half, yellow. Hair of face short, whitish to yellowish. Antenna as in the male. Mesonotum mainly reddish brown, but on each side with a black spot between the humerus and the prealar spine and another behind the suture just above the prealar spine ; humeri and prealar spines yellow ; pleura yellow near the notopleural suture, becoming darker below, the prosternum black, the mesopleura and sternopleura largely reddish brown to brownish black, the colour areas not sharply delineated ; a small black spot above the hind (metathoracic) spiracle and a similar spot above each coxa. Spines of scutellum yellow at apex. Coloration of thorax

largely obscured by fairly dense tomentum, which is for the most part whitish, but which becomes yellow before and behind the mesonotal suture. Abdomen chiefly reddish brown; base of first, apical third of fourth, and apical half of fifth tergites black; second, third and fourth sternites, except broad lateral margins, largely blackish; tomentum short, fairly dense but inconspicuous and not obscuring the background, except for a conspicuous median band, as described in the male, of tomentum reaching from the middle of the third tergite to the apex of the abdomen; this tomentum is, however, pale yellow. Legs as described in the male; the basal third to half of each femur is, however, yellowish. Length, 9 mm.

One female, Cholo, Nyasaland (*R. C. Wood*).

Isomerocera Enderlein.

Isomerocera Enderlein, 1914, *Zool. Anz.* **43**: 202–203; Kertész, 1916, *Ann. Mus. nat. Hung.* **14**: 202–208.
Genotype, *Diphysa maculiventris* Macquart, by monotypy.

Two previously described species have been referred to this genus, the genotype, and *I. quadrilineata* (F.). Some authors have considered these species synonymous, but Kertész believes that they should be considered distinct, at least tentatively, on the basis that in *maculiventris* the last segment of the flagellum is darkened basally and the mesonotum has thick, appressed, yellow pilosity before the suture, whereas in *quadrilineata* the last segment of the flagellum is wholly white and the mesonotum lacks pilosity as above described. A third species, described below as new, differs from both the above in the peculiar structure of the scutellum, the two pairs of spines lying in different planes from each other. All known species of the genus are African.

Isomerocera heteraspis sp. n.

Male.—Head black; vertical triangle anterior to ocelli, frontal triangle, and facial orbits with silvery tomentum; face much less prominent than in *quadrilineata*, clothed with short white pile. Antenna structurally as in *quadrilineata*, chiefly black; extreme apex of first segment, second segment, and first and inner face of second segment of flagellum reddish; terminal segment of flagellum white. Proboscis and palpi black.

Thorax black; mesonotum densely punctulate, with short inconspicuous black hair; presutural area, except for a broad, median, longitudinal band, with violet scales; an area of similarly coloured scales immediately in front of scutellum, broadly interrupted in the middle; pleura largely punctulate and clothed with appressed white hairs, a large area on the anterior part of the mesopleuron and a smaller area on the sternopleuron, bare and shining; a patch of green scales on the mesopleuron, just below the wing base. Scutellum black, densely punctulate, with short black hairs and without irridescent scales; inflated, set at an angle of about 45° to the plane of the mesonotum; median spines strong, about as long as scutellum, set at an angle of about 30° to the plane of the scutellum and, consequently, at an angle of about 75° to the plane of the mesonotum; outer spines much weaker and about half the length of median ones, curved inward and directed but slightly above the plane of the mesonotum.

Coxae, middle and hind femora, and all tibiae chiefly black; anterior femur reddish brown, more blackish posteriorly; tarsi reddish brown. Halter with yellowish stalk and blackish knobs. Wing blackish on basal half, yellow from stigma across apical two thirds of discal cell, yellowish with a slight grayish cast on remainder of apical part; venation essentially as in *quadrilineata*; microtrichia more extensive than in *quadrilineata*, in that

they fill all but the posterior basal corner of the anal cell and some areas at the extreme wing base.

Abdomen black, densely punctulate; fifth tergite with a patch of silvery tomentum on each side of the middle; fourth with a similar patch at each posterior corner; these patches are less conspicuous than in *quadrilineata*, and, unlike that species, are missing on the first three tergites and in the middle of the fourth; venter with scattered short white hairs. Genitalia inconspicuous, reddish brown. Length, 8 mm.

Holotype.—Male, West Ruwenzori, 8000 to 9000 ft., July, 1946 (*van Someren*).

Hermetiomima Grünberg.

Hermetiomima Grünberg, 1915, *Mitt. zool. Mus. Berlin* **8**: 53–56.
Type, *H. melaleuca* Grünberg, by monotypy.

Hermetiomima melaleuca Grünberg.

Hermetiomima melaleuca Grünberg, 1915, *Mitt. zool. Mus. Berlin* **8**: 55–56.
Dolichodema brevicephala Brunetti, 1926, *Rev. Zool. Afric.* **14**: 124–125 (**syn. nov.**).

The above synonymy seems fairly certain. The only discrepancy of consequence in Brunetti's description is the statement "coxae . . . yellow," whereas this applies, in the specimens before me and according to Grünberg's description, to the front coxae only. The types of *H. melaleuca* are from Rio Muni; those of D. *brevicephala*, from Albertville, Belgian Congo. I have seen 7 males and 1 female from Bwamba Valley, July, 1945 (*van Someren*).

Drosimomyia Kertész.

Drosimomyia Kertész, 1916, *Ann. Mus. nat. Hung.* **14**: 160.
Genotype, *D. natalensis* Kertész, by monotypy.

Drosimomyia oldroydi sp. n.

Male.—Ground color of head, thorax, and abdomen, exclusive of appendages, entirely black. Frons parallel-sided, one-third width of head; face but slightly broader, almost parallel-sided; frons in middle glossy, the frontal orbits, vertex, ocellar triangle and median sclerite of occiput but slightly less shining; facial orbits and extreme lower frontal orbits densely silvery pruinose; face, an area above the base of the antennae, and most of the occiput subshining, with noticeable yellow pile. Antennae yellow; flagellum darkened on inner aspect; arista brown. Proboscis largely black, the haustellum, however, yellow. Mesonotum, except laterally, and scutellum golden-pilose; sides of mesonotum and pleura pale yellow tomentose and pilose. Legs, including coxae, wholly yellow. Wings hyaline; veins yellow, the stems of the radius and of the cubitus more brownish, the veins forming the discal cell, except its base, and those emerging from it unpigmented; halteres yellow, with white knobs. Disc of abdomen with golden tomentum which is visible, however, only under certain lights; sides of terga and venter with pale yellow pile. Genitalia yellow. Length, 3 mm.

Female.—Frons very slightly wider than in male, about width of face. Tomentum of mesonotum and scutellum yellow, that of pleura becoming whitish. Otherwise, except sexually, as in female.

Holotype.—Male, Asmara, Eritrea, 2350 metres, 17th February, 1947 (*G. de Lotto*); *Ex* branches of *Euphorbia abyssinica* J. F. Gmel., already infested by *Homoeometamelus tibialis* Hust. *Allotype*.—Female, same data. *Paratopotypes*.—4 males, 9 females, same data.

Related to *D. natalensis* Kertész, but the haustellum is largely yellow and the mesonotal tomentum is for the most part pale yellow in the female and golden in the male. According to Kertész, in *D. natalensis* the proboscis is wholly black and the mesonotal tomentum is brassy-yellow in the male and silvery in the female. Unless other differences occur, the distinction is slight, and *D. oldroydi* may be only a subspecies of the more southern form. The only other known species of this genus, *D. mercurialis* Lindner (1939, *Ruwenzori Expedition* 2 (1 2) : 11), is distinguishable from both the above in having the antennal flagellum dark brown and in that vein R_4 is present, though tending to be evanescent. The total absence of vein R_4, as Lindner has shown, is not strictly a generic character here.

NOTES ON CERATOPOGONIDAE.

By the late J. W. S. Macfie, M.A., D.Sc., M.B., Ch.B.

1. New species of *Forcipomyia* and *Atrichopogon* from the State of Chiapas, Mexico.

The specimens described below were found during the examination of a sample of a very large collection of Mexican Ceratopogonidae made by Dr. Alfonso Dampf. In this sample (4052 specimens) the only genera represented are *Forcipomyia*, *Lasiohelea*, *Atrichopogon*, *Culicoides*, *Dasyhelea* and a single damaged insect, probably a *Stilobezzia*. The majority, over 80 per cent., are *Culicoides*, with 8–9 per cent. each *Forcipomyia* and *Atrichopogon*, and only a very few *Lasiohelea* (2) and *Dasyhelea* (4). I have reported elsewhere (*Ann. trop. Med. Parasit.* **42** : 67–87) on the species of *Culicoides*. Any consideration of the collection as a whole on the basis of this sample would be fallacious, or any comparison with the Ceratopogonid fauna of neighbouring areas, but it can be said, however, that many species found in Brazil and in the islands of the Caribbean sea occur also in this part of Mexico, such species as (excluding *Culicoides*), for example, *Forcipomyia annulatipes* Macfie, *F. discoloripes* Macfie, *F. dubia* Macfie, *F. flavifemoris* Macfie, *F. inornatipennis* (Austen) var. *ornaticrus* Ingram & Macfie, *F. quasi-ingrami* Macfie, *F. raleighi* Macfie, *F. squamitibia* Lutz, *Lasiohelea stylifer* (Lutz), *Atrichopogon adamsoni* Macfie, *A. woodfordi* Macfie, *Dasyhelea scissurae* Macfie, and *D. thalestris* Macfie.

Forcipomyia insignipalpis sp. n.

A darkish brown (but not blackish) species bearing narrow scales, with unadorned wings, the hind legs adorned with a darkish brown band on each side of the knees, the T.R. about 0·5, and unusual palps.

♀. Length of wing about 1·4 mm., greatest breadth 0·5 mm.

Head blackish. Eyes bare, contiguous above. Palpi rather dark, of unusual form as shown in the figure (fig. 1); lengths of last three segments in one specimen about 20.

Fig. 1.—*Forcipomyia insignipalpis* sp. n., palp of female.

24 and 3 units[1] respectively. Antennae with torus yellowish brown, segments 3–10 pale brown or yellowish, and the others slightly infuscated; segments 4–10 subspherical, ranging in one specimen from 9 by 10 to 10 by 9 units; 11–14 more elongate, subequal,

[1] The unit used is approximately 3·7 μ.

lengths about 25 units; 15 a little longer, 34 units (including knob-like stylet of about 3 units). The combined lengths of segments 3–10, 4–10 and 11–15 about 75, 65 and 134 units respectively.

Thorax darkish brown, shoulder areas paler, yellowish. Scutellum very dark brown. *Wings* unadorned, without pale spots, but well clothed with macrotrichia, and those on costa and radial veins scale-like and darker than others, forming dark patch in this area. Venation normal; fork of Cu proximal to level of end of costa. Halteres with white knobs. *Legs* yellowish brown, bearing narrow scales. No modified tibial spines. Knees pale, yellowish. Hind legs rather faintly adorned with narrow dark bands on each side of knees, other legs almost if not quite unadorned. T.R. about 0·5. *Abdomen* very dark brown, bearing numerous narrow dark scales. Not banded, but sides and cerci (but not end of abdomen) pale. Spermathecae 2, well chitinized, obovate, subequal, total length about 85μ (of which about 7μ may be regarded as chitinized commencement of duct) and greatest breadth about 60μ.

Holotype, ♀, and paratypes, 2 ♀, CHIAPAS, San Cristobal, N. of Aurora, 1090 m., 9.iii.1938, taken at night (7 p.m. until morning) by means of a trap lamp.

This species may be distinguished from all others resembling it by the unusual form of the palps.

Forcipomyia nuncupata sp. n.

A darkish brown species with a single rectangular pale spot about the middle of the anterior border of the wing, closely resembling *F. poulaineae* Ingram and Macfie, but with the T.R. less, only about 0·5.

♂, ♀. Length of wing about 2 mm., rather longer and narrower in male than in female. *Head* very dark brown. Eyes bare. Palpi rather dark brown, with third segment much inflated at base, especially in female, with a deep pit. Antennae pale brown or yellowish, but torus deep yellowish brown, and distal segments somewhat infuscated. In male plume large, brown; segments 4–11 in one specimen ranging from about 18 by 17 to 18 by 10 (maximum) units, and 12–15 elongate, their lengths about 70, 38, 29 and 33 (stylet 5) units respectively. In female segments 4–10 with narrowed necks, ranging in one specimen from about 15 by 11 to 17 by 10 units; 11–14 slightly more elongate, with less pronounced neck, subequal, 21–25 by 9 (maximum) units; 15 a little longer, subcylindrical, about 34 (stylet 5) by 7 units; the combined lengths of segments 3–10, 4–10 and 11–15 about 132, 116 and 127 units respectively. *Thorax* dark brown, without scales. Scutellum dark brown in middle, paler brown at sides; bearing numerous bristles and hairs. *Wings* well clothed with macrotrichia, but without definite scales; adorned with a single rectangular pale spot just beyond end of costa. There is, too, a small, ill defined, and slightly paler area covering cross-vein, and extreme base of wing is pale. Macrotrichia on each side of pale spot especially dark, thus forming two dark patches on anterior border of wing. In male wings as a whole pale, with these dark patches more conspicuous than in female; some macrotrichia along veins are also darker than rest, especially those covering fork of Cu, along Cu2, and over distal part of M1. Venation normal; second radial cell small, triangular; fork of Cu at about same level as end of costa. Halteres with white knobs. *Legs* rather pale brown, without definite scales or modified tibial spines. Knees pale. Hind legs with narrow dark band on each side of knees; middle legs with traces of similar adornment. Tip of tibia on fore and hind legs with small dark spot. T.R. about 0·5; slightly less in male, slightly more in female. *Abdomen* dark brown at tip, but paler at base; without definite scales although (especially in female) some hairs resemble narrow scales. In female, cerci and 8th segment paler than rest. Spermathecae

2, well chitinized, obovate, relatively small, subequal, about 70μ by 52μ, with only a short part (about 5μ) of commencement of duct chitinized. In male abdomen definitely banded and with basal tergites almost completely pale brown. Hypopygium dark brown, in all respects apparently as in *F. poulaineae*.

Holotype, ♂, and paratypes, 38♂, 108 ♀, CHIAPAS, San Cristobal, N. of Aurora, 1090 m., 9.iii.1938, taken at night (7 p.m. until morning) by means of a trap lamp.

This insect is perhaps the Mexican equivalent of *F. poulaineae* Ingram and Macfie, a species originally taken at Buenos Aires, of which at present only the male is known.

Forcipomyia spatuligera sp. n.

A darkish brown species with a single, small, pale spot on the anterior border of the wing; resembling in many respect *F. squamitibia* Lutz, but with the femora of the hind legs adorned with a dark brown band about the middle.

♀. Length of wing 1·1–1·3 mm.; greatest breadth about 0·5 mm.

Head very dark brown or blackish. Palpi dark brown, damaged in all the specimens before me; third segment inflated at base, with deep pit. Antennae missing. *Thorax* and scutellum dark, or very dark, brown. *Wings* adorned as in *F. squamitibia* with a single, small, pale spot on anterior border covering second radial cells. Well clothed with macrotrichia, but without definite scales, although the macrotrichia on radial veins are somewhat scale-like. Fork of Cu slightly distal to level of end of costa. Halteres with white knobs. *Legs* mainly yellowish brown, without definite scales, but bearing modified spines on tibiae. Knees all pale. Hind legs with dark brown band occupying middle third of femur and traces of similar band (best seen on extensor aspect) on tibia; other legs with faint traces of infuscation on basal half of femur and apical half of tibia. T.R. about 1. Modified spines on tibiae rather broad, striated, resembling those of *F. chilensis*; that is broader than those of *F. squamitibia*, and with blunter ends. *Abdomen* very dark brown above, paler at sides. Tip and cerci paler, yellowish. Well clothed with hairs, but without definite scales. Spermathecae 2, well chitinized, oval or obovate, subequal, in one specimen measuring about 67μ by 37μ; practically no part of duct chitinized.

Holotype, ♀, and paratypes, 2 ♀, CHIAPAS, San Cristobal, N. of Aurora, 1090 m., 9.iii.1938, taken at night (7 p.m. until morning) by means of a trap lamp.

This species is briefly described in spite of the damaged condition of the specimens because it must be distinguished from *F. squamitibia* Lutz, a species taken with it at San Cristobal, with which it may easily be confused. *F. chilensis* (Philippi), which bears similar tibial spines, is a larger species, the wing length 1·7–2 mm., and much darker, very dark brown or almost black.

Forcipomyia squamitibia Lutz.

CHIAPAS, San Cristobal, N. of Aurora, 1090 m., 9.iii.1938, 15 ♂, 20 ♀, taken at night (7 p.m. until morning) by means of a trap lamp.

Although somewhat smaller, the females agree closely with the single specimen taken in Brazil which I (in 1939) referred to this species. The males which I associate with them have not previously been collected and I therefore give here a brief description of them.

♂. Length of wing 1·4–1·5 mm., greatest breadth 0·4–0·5 mm.

Head very dark brown. Palpi dark brown; third segment with deep pit. Antennae with dark brown plume; lengths of last five segments in one specimen 13, 47, 33, 25 and 34 (including knob-like stylet of 4 units) units respectively. *Thorax* rather dark yellowish brown, with golden brown hairs; without scales. Scutellum similar. *Wings* pale, with small yellowish spot covering second radial cell. On anterior border of wing on each side of pale spot is a patch of especially dark macrotrichia. When viewed with a hand lens it is these dark patches, especially the distal one, rather than the pale spot which attracts attention. There are no definite scales. Halteres white. *Legs* unadorned, almost uniformly yellowish brown, but with two basal segments deeper brown, and tarsal segments a little infuscated. No definite scales, and no modified tibial spines. T.R. about 1. *Abdomen* almost uniformly yellowish brown above, with discontinuous dark brown patches beneath; without definite scales. Hypopygium darkish brown at base, paler distally. Ninth sternite not excavated in middle. Side-pieces darker at base than at tip; claspers pale, yellow. Harpes (fig. 2) very long and slender, tapering to filiform ends. Aedeagus of usual form.

2

Fig 2.—*Forcipomyia squamitibia* Lutz, ventral view of harpes of male.

3

Fig. 3.—*Atrichopogon altivolans* sp. n., abdominal armature of female.

Atrichopogon adamsoni Macfie.

Puerto Ocos, Guatemala border, near Hacienda Santa Clara, 19.xi.1932, 114 ♂, 37 ♀, swept from a trolley on a quiet afternoon (4.23–4.28 p.m.), in sunshine in pasture land alternating with tropical bush.

The females do not seem to differ in any respect from those taken in Trinidad. The chief characters of the male, which has not previously been described, are as follows:

♂. Length of wing about 1·1 mm., greatest breadth 0·3 mm.

Head very dark brown. Eyes hairy. Palpi pale brown; third segment subcylindrical, with very small pit; lengths of last three segments about 12, 10 and 7 units respectively. Antennae darkish brown; segments 4–11 ranging from about 12 by 10 to 12 by 6 units; lengths of 12–15 about 17, 26, 24 and 28 (stylet 6) units respectively. *Thorax* and scutellum as in female. *Wings* unadorned, without macrotrichia. As in female, petiole of M shorter than cross-vein, and fork of Cu at about same level as base of second radial cell. Halteres with pale yellowish knobs. *Legs* yellowish brown, as in female. T.R. a little over 1. *Abdomen* pale brown. Hypopygium yellowish, of usual type, rather feebly chitinized and without any characteristic features. Ninth sternite not excavated in middle line posteriorly, bearing a transverse row of 6 bristles.

Atrichopogon altivolans sp. n.

A yellowish brown species resembling *A. insigniventris* Macfie, but larger, lighter in colour, and with a distinctive abdominal armature.

♀. Length of wing about 1·6 mm., greatest breadth 0·6 mm.

Head dark yellowish brown. Eyes hairy in part at least. Palpi very dark brown, slender, third segment scarcely at all inflated, but with deep pit; lengths of last three segments in specimen measured about 22, 11 and 15 units respectively, the last one tapering distally. Antennae blackish, torus nearly as dark as flagellum segments; segments 4–10 in one specimen ranging from 8–9 by 10–11 units to 8–9 by 8–9 units; 11–14 more elongate, subequal, about 20 by 8–9 units; 15 longer, about 32 units, including the stylet of 5 units. Combined lengths of segments 3–10, 4–10 and 11–15 about 70, 58, and 112 units respectively. *Thorax* rather dark yellowish brown with traces of usual adornment. Scutellum paler, yellowish, bearing usual 3–4 bristles, and a few small hairs. *Wings* unadorned, brownish. Macrotrichia fairly numerous at tip in cells R5 and M1, and at extremity of vein M1; none elsewhere (or only an odd one or two). Venation normal; both radial cells well formed; petiole of M scarcely as long as cross-vein, and fork of Cu well distal to that of M. Halteres with white knobs. *Legs* slender, yellowish brown, unadorned. Apical spine on tibia of hind legs small, yellowish. T.R. about 2·7. *Abdomen* yellowish brown, somewhat darker above; tip and cerci scarcely paler than rest, not conspicuously yellow. Ventral armature as shown in figure (fig. 3), somewhat similar to that of *A. insigniventris*, but whereas in *A. insigniventris* there is a patch of short bristles on each side of vulva, in this species, in this situation, is a comb-like arrangement of large spines. Spermatheca single, well chitinized, obovate, total length about 89μ (of which 15μ may be regarded as chitinized commencement of duct), and greatest breadth 66μ.

Holotype, ♀, and paratypes, 2 ♀, Chiapas, between Santa Julia and Santa Rita, N. of Huixtla, 1000–1500 m., 15.iii.1938, swept from the air when riding along mountain crest in virgin forest.

Atrichopogon nubeculosus sp. n.

A blackish species with adorned wings, resembling *A. nebulosus* Macfie, but differing as indicated below.

♀. Length of wing about 1·3 mm., greatest breadth 0·48 mm.

Head blackish. Eyes hairy. Palpi pale brown; segment 3 inflated, but narrowed distally, with large pit, 4 and 5 indistinctly separated; lengths of last three segments about 15, 11 and 9 units respectively. Antennae missing. *Thorax* dark brown or blackish, containing an opaque substance. Scutellum blackish, bearing 4 bristles and a few small hairs. *Wings* adorned as in *A. nebulosus*. Macrotrichia fairly numerous at tip in cell

R5, a few in cell M1 and along distal portion of vein M1, but none (or only an odd one or two) elsewhere. Venation as in *A. nebulosus*. Halteres with almost white knobs. *Legs* almost uniformly pale yellowish brown, only tarsal segments a little more infuscated than others. T.R. about 2·8. Form of segments, claws and empodium normal. Apical spine on tibia of hind leg rather short, not longer than comb, yellowish. *Abdomen* brown, containing an opaque substance. No ventral armature of usual type, but having on each side of middle line at level of 8th segment a chitinized blade-like structure with its point directed posteriorly. Spermatheca single, feebly chitinized and therefore only visible after maceration, somewhat crumpled in the unique specimen but apparently oval and about 120μ by 75μ; the duct narrow (diameter only about 4μ) and feebly chitinized for some distance (30–40μ).

Holotype, ♀, Chiapas, El Vergel, 4.vi.1935, "at light."

This insect, although damaged, is briefly described because of its resemblance to the Brazilian species, *A. nebulosus* Macfie. To judge from this single specimen the Mexican species is smaller than *A. nebulosus*, and bears fewer macrotrichia on the wings, and differs notably in the form of the spermatheca.

Atrichopogon pallidipes Kieffer.

Chiapas, between Santa Julia and Santa Rita, N. of Huixtla, 1000–1500 m., 15.iii.1938, 4 ♀, swept from the air when riding along mountain crest in virgin forest.

The following are the chief characters of this species which may be the same as *A. pallidipes* K., a species originally taken in Paraguay.

♀. Length of wing about 1·5 mm., greatest breadth 0·5 mm.

Head almost black. Eyes hairy. Palpi dark brown, third segment a little inflated, with deep pit, fifth tapering distally; lengths of last three segments in specimen measured about 17, 14 and 9 units respectively. Antennae dark brown, especially basal segments, but torus more yellowish brown; segments 4–10 all ellipsoidal, ranging from about 13 by 7–8 units to 16 by 7 units; 11–14 more elongate, subequal, about 30 by 6 units; 15 longer, about 49 units (including pointed stylet of about 8 units). Combined lengths of segments 3–10, 4–10 and 11–15 about 109, 92 and 170 units respectively. *Thorax* and scutellum almost black. *Wings* unadorned, brownish. Macrotrichia fairly numerous at tip in cells R5 and M1 and at extremities of veins M1 and M2, but none or almost none elsewhere. Venation normal; both radial cells well formed, petiole of M slightly shorter than cross-vein, and fork of Cu well distal to that of M. Halteres with whitish knobs. *Legs* deep yellowish brown, unadorned. Apical spine of hind tibiae yellowish. T.R. about 2·8. *Abdomen* very dark brown, but not so dark as thorax; cerci (but not tip of body) paler, yellowish brown. No ventral armature. Spermatheca single, pitted at base, spherical, diameter about 93μ; duct not unusually broad (about 10μ), chitinized for short distance, about 11μ.

Comparatively few species of *Atrichopogon* have the basal segments of the antenna of the female all clearly ellipsoidal. Other species from South America which I have seen, such as *A. flavicaudae* Macfie and *A. cryptogamus* Macfie, differ from *A. pallidipes* in having the tip of the abdomen yellowish.

Atrichopogon santaeclarae sp. n.

A rather small and almost black species with, however, the end of the abdomen paler, yellowish; without macrotrichia on the wings of either sex, and with the abdomen of the female armed.

♂, ♀. Length of wing 1·2–1·3 mm., greatest breadth about 0·4–0·5 mm.

Head blackish. Eyes hairy, Palpi rather dark brown ; third segment slightly inflated, with deep pit ; lengths of last three segments in both sexes about 14–15, 8 and 12 units respectively. Antennae darkish brown ; in male plume large, and lengths of last four segments about 18, 25, 24 and 39 (stylet 6) units respectively ; in female segments 4–10 ranging from about 8 by 8 to 8 by 7 units, 11–14 elongate, subequal, 18–22 units, and 15 about 29 (stylet broken off) units. *Thorax* blackish. Scutellum also blackish, quite as dark as scutum, bearing in both sexes the usual 4 bristles and a few small hairs. *Wings* unadorned, brownish, without macrotrichia in either sex. First radial cell slit-like or almost obsolete in both sexes ; second also narrow in female, but well open in male. In both sexes radial veins almost devoid of bristles, petiole of M about as long as cross-vein, and forking of Cu at a level well distal to that of M. Halteres with whitish knobs. *Legs* brown, much paler than thorax, with femora of hind legs a deeper brown than rest. T.R. in both sexes about 2·6–2·7. Apical spine on tibia of hind legs small, scarcely as long as comb bristles, yellowish. *Abdomen* blackish, but tip in both sexes paler, yellowish. In female ventral armature somewhat similar to that of *A. harrisi* Macfie, but with median tuft more tassel-like, with (one specimen) about a dozen short branches. Spermatheca single, well chitinized, obovate, total length about 90μ and greatest breadth about 63μ. In male hypopygium yellowish and rather feebly chitinized, of usual form without any characteristic features ; ninth sternite not excavated, bearing in one specimen 10 bristles in two rows (7 and 3), claspers yellowish, rather feebly chitinized, in shape resembling those of *A. gordoni* Macfie.

Holotype, ♂, and paratypes, 2 ♂, 2 ♀, Puerto Ocos, Guatemala border, near Hacienda Santa Clara, 19.xi.1932, swept from a trolley on a quiet afternoon (4.23–4.28 p.m.), in sunshine in pasture land alternating with tropical bush.

This insect must be distinguished from *A. columbianus* Kieffer, from which it differs, however, in a number of small characters as well as more notably in having the abdomen yellowish at its tip and, in the female, armed ventrally.

2. A species of *Lasiohelea* which preys on mosquitoes.

Lasiohelea insignicornis Macfie.

Uganda : Entebbe, 1947, 2 ♀ found attached to the thorax of mosquitoes, the one on *Taeniorhynchus aurites*, and the other on *T. fuscopennatus* (*Dr. A. J. Haddow*).

These specimens correspond well with the type (which was also taken at Entebbe), but are slightly larger (length of wing about 1·0 mm.), and are better preserved. The hairs on the mesonotum are rather long and dark. The palpal pit, however, is deeper, and the T.R. somewhat less, about 2·6. Their capture is recorded here to draw attention to the interesting fact that the species may prey on mosquitoes.

A NEW BRITISH SPECIES OF *APHIS* L. FROM *RHAMNUS CATHARTICUS* (HOMOPTERA, APHIDIDAE).

By C. T. Gimingham.
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AND

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(*Bennekom, Netherlands*).

Aphis mammulata sp. n.

Apterous viviparous female.

Body as normal for the genus, about 1·45–1·60 mm. long (probably longer in early summer forms). Head, pronotum, meso- and metapleura partly sclerotized, a few very small spinal sclerites on meso- and metanotum and on 6th abdominal tergite, and the stigmal plates rather dark sclerotic; the rest of the body membranous and not pigmented. Only the sclerotic areas on the meso- and metathorax distinctly reticulated, the rest usually rather smooth. Dorsal hairs, and also those on the 8th abdominal tergite, blunt, much shorter than basal diameter of the 3rd antennal segment; ventral hairs long and thin, acute; abdominal segments II–IV with normally 4 marginal hairs on each, one pair of the dorsal type and one pair of the ventral type, the latter 2–3 times as long as the former. Lateral tubercles enormously developed, low-conical, blunt, brownish; pronotum with marginal tubercles about as large as the compound eyes; abdominal segments I–IV and

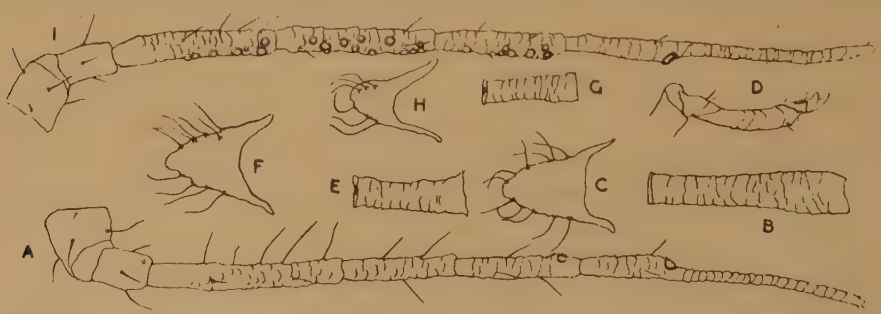


Fig. 1.—*Aphis mammulata* sp. n. *Apterous viviparous female.* A, antenna; B, siphunculus; C, cauda; D, hind tarsus. *Oviparous female*: E, siphunculus; F, cauda. *Apterous male*: G, siphunculus; H, cauda; I, antenna. All magnified × 128.

VII with lateral tubercles of not much smaller size, those of 1st segment sometimes with a small tubercle sideways superimposed; 6th segment sometimes with much smaller marginal tubercles. Front normal. Antennae about ½ to ⅝ the length of the body, with the basal segments darkish, the flagellum[1] pale with dark apex, evenly imbricated; processus terminalis about as long as 3rd segment, not quite twice as long as base of 6th segment. Hairs

[1] The *flagellum* is defined as that part of the antenna distal to the two basal joints, the scape and the pedicel. It has sometimes been used in describing aphids to mean the apical part of the last antennal segment, here called the *processus terminalis*.

on 3rd segment not very numerous, but very fine and long, up to twice the basal diameter of the segment, much spreading; hairs on 6th segment much shorter. Rostrum about reaching the hind coxae, with ultimate segment normal, bearing 2 long hairs besides the 3 apical pairs. Siphunculi about $\frac{1}{7}$ the length of the body, at base of normal width, but rather strongly tapering for about $\frac{2}{3}$ to $\frac{3}{4}$ of the length, beyond which they are thin and often widen again towards the scarcely developed flange; surface evenly and distinctly imbricated; pigmentation somewhat variable, from evenly dark to rather pale with the apices and the extreme base dusky. Cauda rather thick, elongated conical with semi-blunt apex, very slightly or not constricted, as dark as the middle part of the siphunculi and about $\frac{3}{5}$ to $\frac{2}{3}$ of their length, with about 8–13 hairs. Subgenital plate with 2–6 hairs on anterior half and an interrupted row of about 14 along posterior margin. Legs normal, with the apices of the femora dark brownish, those of the tibiae black and the remaining parts yellowish to pale brownish; first tarsal joints with 3, 3, 2 hairs of about equal length; hairs on tibiae moderately long.

Measurements in mm. and Proportions of Antennal Segments.

	Length.				Proportions of antennal segments.			
Number.	Body.	Antennae.	Siphunculi.	Cauda.	III.	IV.	V.	VI.
1	1·48	0·92	0·235	0·13	100	65	67	(57 + 104)
2	1·47	0·96	0·20	0·12	100	64	67	(59 + 106)
3	1·53	0·97	0·21	0·13	100	63	65	(53 + 97)
4	1·59	0·84	0·22	0·14	100	61	63	(56 + 102)

(1–4 from *Rhamnus catharticus*, Eastleach Martin, Oxon, England, 20.ix.1941, Leg. C.T. Gimingham).

Oviparous female.

Much like apterous viviparous female, but body more elongated, about 1·38–1·60 mm. long. Sclerites on thorax and abdomen absent or inconspicuous, only the head rather dark. Marginal tubercles distributed as in apterae viviparae, only slightly smaller. Antennae sometimes of 5 segments or with indistinct division between segments III and IV, about half as long as body; processus terminalis very markedly longer than 3rd segment in specimens with 6 segmented antennae, just shorter than 3rd segment if only 5 segments are present. Siphunculi very much shorter than in apterae viviparae, about $\frac{1}{14}$ the length of the body, almost cylindrical with slightly widened base, pale with dusky apex. Cauda, very blunt, thick, not constricted, dark, about as long as or just longer than the siphunculi, with 9–12 curved hairs. Subgenital plate, as usual in oviparae, divided, hairy all over. Hind tibiae not darker than the other tibiae, not swollen, with some 10–25 inconspicuous pseudosensoria on the middle portion or on the distal half.

Measurements of two specimens.—(1) Length of body, 1·38 mm.; antennae, 0·71 mm.; siphunculi, 0·10 mm.; cauda, 0·105 mm. Proportion of antennal segments: III 100 : IV 85 : V 98 : VI (92 + 159). (2) Length of body, 1·50 mm.; antennae, 0·73 mm.; siphunculi, 0·105 mm.; cauda, 0·10 mm. Proportion of antennal segments: III 100 : IV 79 : V 92 : VI (79 + 139). (Data as for apterous viviparous females.)

Apterous male.

Body rather narrow. Sclerotization about as apterous viviparous female, but more strongly developed, so that the anterior half of the body is mainly dark sclerotic, while the abdomen besides the sclerites mentioned shows small marginal sclerites between the large marginal tubercles; abdominal tergum slightly reticulated, notably towards the margins. Lateral tubercles, especially those on abdominal segments II–IV usually smaller than in the other known forms. Antennae quite dark except the very base of the 3rd

segment, which is pale ; 3rd segment with the rhinaria mainly on distal half, irregularly along one side ; those on 4th and 5th segment along one side, not in a row. Siphunculi dark, rather thin. Cauda dark, as in oviparae, but blunter. Genitalia normal. Other characters as in apterous viviparous female.

Measurements of the specimen.—Length of body, 1·21 mm. ; antennae, 0·90 mm. ; siphunculi, 0·115 mm. ; cauda, 0·09 mm. Proportion of antennal segments : III 100 : IV 81 : V 78 : VI (59 + 96). Rhinaria on 3rd antennal segment, 8 and 8; on 4th, 10 and 12 ; on 5th, 7 and 8. (Data as above.)

Locality.—Near Eastleach Martin, on the border of Gloucestershire and Oxfordshire, 20th September, 1941.

Host-plant.—Rhamnus catharticus L.

Found in dense clusters on the petioles of the berries with a few scattered individuals on the undersides of the leaves. Apterae and sexual forms present ; no alatae. General coloration greenish grey, with a sprinkling of reddish brown young forms among them. From the presence of apterous males it may be concluded that the species does not migrate and completes its cycle on *Rhamnus*.

Discussion.—The species is easily recognizable by the strong development of the marginal tubercles. In this respect it resembles *Toxopterina vandergooti* (Börner), which lives on the underground parts of *Achillea*, *Tanacetum* and *Chrysanthemum* ; the most marked of many differences between the two similar species is the length of the processus terminalis, which in *vandergooti* is remarkably long, but in *mammulata* short. The difference in length of the marginal hairs on the four anterior abdominal segments is remarkable and it should be worth while to investigate in which other species of *Aphis* this phenomenon occurs. In the oviparae, a tuft of marginal hairs on the 8th abdominal segment, absent in other forms, is conspicuous, and can be seen in the photograph. This character, however, is also known in oviparae of other *Aphis* species.

The three species which Del Guercio (1) describes in his paper on *Rhamnus* aphids are different from the one described here. Two of these, *Toxoptera variegata* Guercio, 1909, and *Toxoptera alaterni* Guercio, 1909, are synonyms of *Toxoptera aurantii* (Fonsc., 1841). The identity of Del Guercio's *Macchiatiella rhamni* (Fonsc.) is not clear, but it is certainly a species quite different from that which is generally understood to be *rhamni* Fonsc., viz. *Aphis rhamni* Fonsc., 1841. Unfortunately Del Guercio's types and material appear to have been destroyed at Naples during the war by a bombardment, and the student of aphids is once again left with a large number of mostly poor descriptions without the possibility of studying the original material.

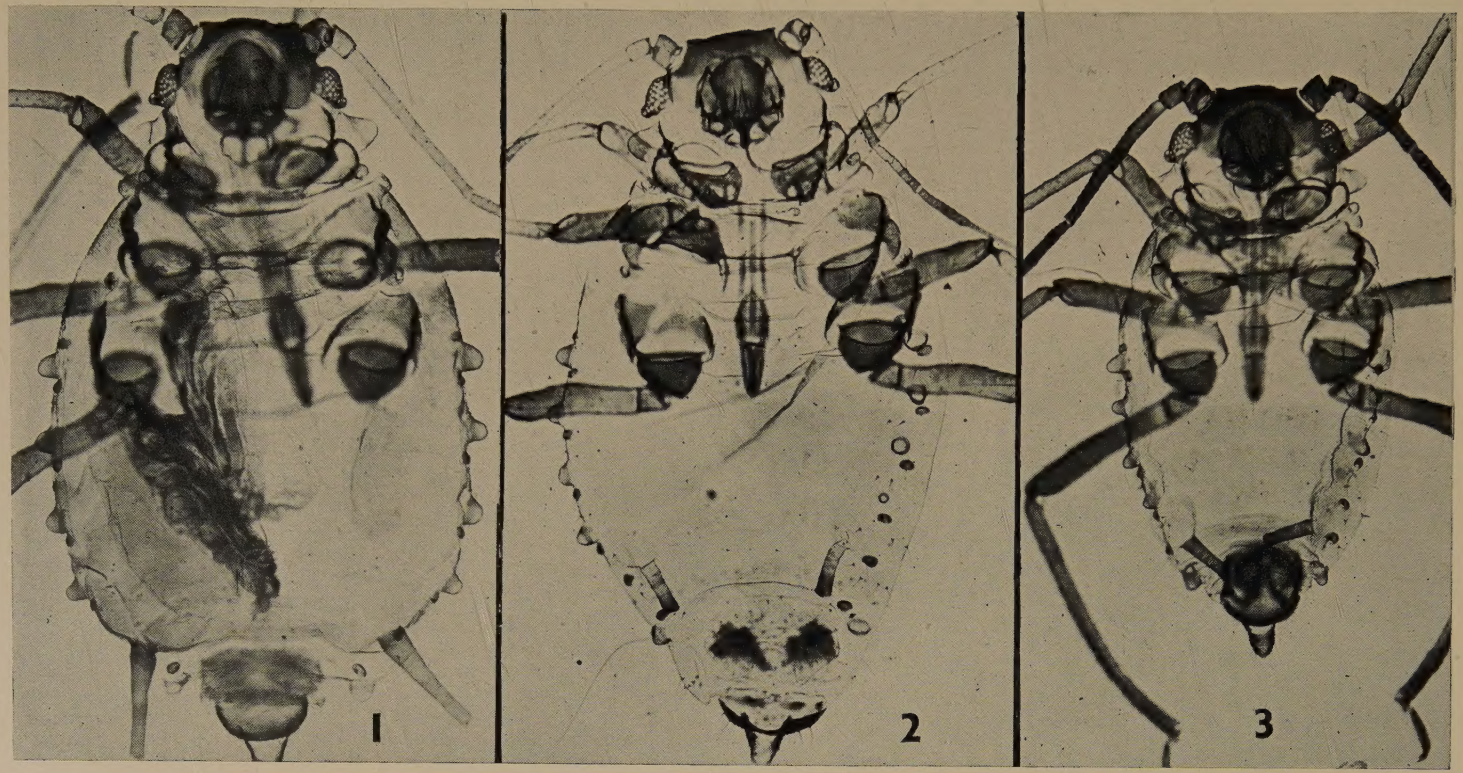
Types.—Co-types of the new species are in the collections of both authors.

Acknowledgments.

The authors wish to express their thanks to Dr. Roberti, of Portici, Italy, for his kindness in copying del Guercio's paper.

Reference.

(1) Guercio, G. del, 1909, *Riv. Path. veg.* (2) **4**: 4–10.



Aphis mammulata sp. n. (1) Apterous viviparous female; (2) Oviparous female; (3) Apterous male. All magnified approx. × 75.

C. T. Gimingham and D. Hille Ris Lambers.

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